

American Forestry

JANUARY

1911

LESSONS FROM THE FOREST

By EDWIN R. JACKSON

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By W. R. BROWN

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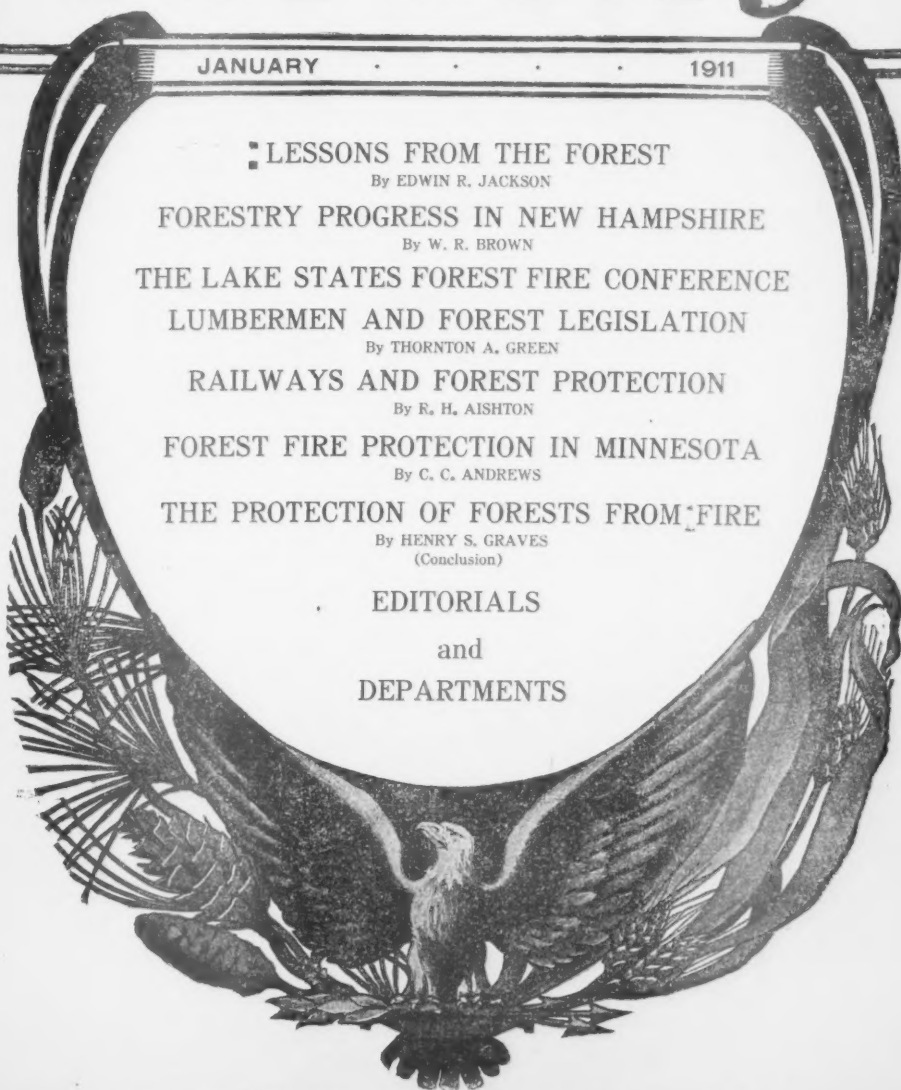
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American Forestry

The Magazine of the American Forestry Association

EDWIN A. START, EDITOR

January

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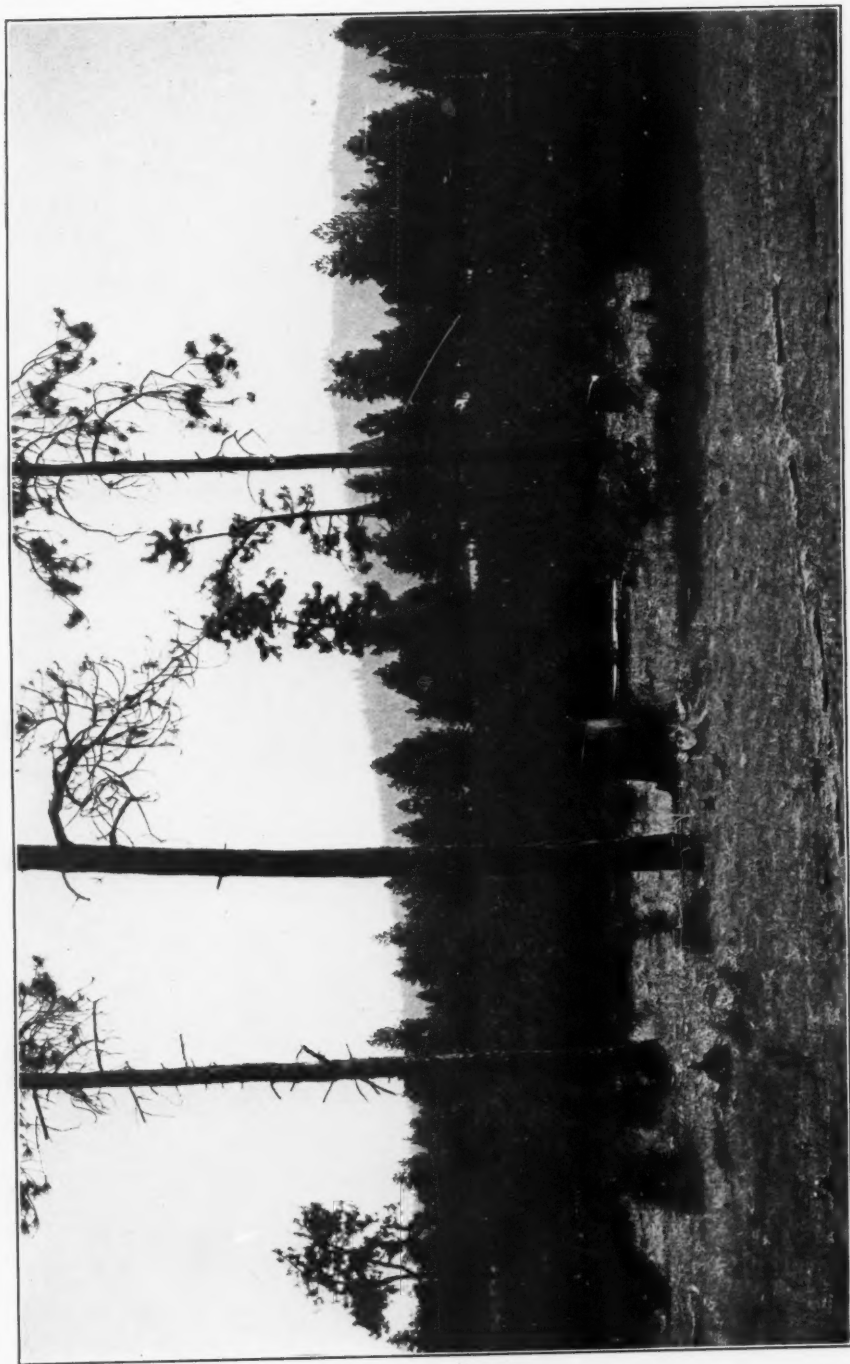
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LESSONS FROM THE FOREST

REPRODUCTION BY SEEDING—AN INTERESTING BOTANICAL STUDY

American Forestry

VOL. XVII

JANUARY, 1911

No. 1

LESSONS FROM THE FOREST

By EDWIN R. JACKSON.

UNITED STATES FOREST SERVICE.

(This was delivered in substantially its present form as an address before the Iowa State Teachers' Association at Des Moines, November 3, 1910.)

I HAVE desired, in preparing this paper, to help a little in solving the problem of how to make the every-day work of the school interesting and profitable. If I fail to do so, it will be because of lack of ability to make you see from my viewpoint; not because my heart isn't right. I would like to begin immediately to point out some of the interesting things which the forest offers in the way of "teacher's helps," but in order to make myself and my purpose clear, I find that a few words of explanation are necessary, so at the risk of being pedantic, I must take time for a short introduction.

You have all doubtless been reminded many times of that rather vague but very comprehensive statement of Herbert Spencer, that "Education is the preparation for complete living." We frequently misquote this, or at least misinterpret it, and tell our pupils that they must go to school in order to "prepare for life!" How many school boys do you suppose have heard this statement from parent or teacher and secretly resolved to cut out the preparation and get into the real thing as soon as possible? We make the school appear not as a very necessary part of life, but as a sort of purgatory which precedes that blessed state. Do you blame the boy for wanting to shorten his stay there? Then we have the audacity to tell him that school days are the happiest days of *life*. What hypocrites our children must sometimes think us! Let us first get on solid ground and teach that school work is as much the business of life as selling goods, and that education is acquainting ourselves with the field of our labors, quite as much as the first trip of the new salesman over his route or the apprenticeship of the tradesman.

Assuming this to be true, we must at once conclude that familiarity with one's environment is essential to success in life. By success, I mean not so much ability to outstrip one's competitors as the ability to serve one's fellow-men; to meet each situation which arises, with confidence; and to live happily and in content.

I observed a curious incident recently in one of the magnificent hotels of an eastern city. Two men entered the building at about the same time. One was tall, broad-shouldered and powerfully built. His tanned features and calloused hands showed that he was accustomed to hard work, and his muscles

as strong as steel; yet he approached the clerk's desk with every sign of timidity and even fear. There followed close on his heels a dapper little, undersized, sallow-faced person, loose-muscled and physically insignificant—yet he walked forward with the utmost self-confidence and ease of bearing. The big man could easily have broken the little fellow in two, if it had come to a test of physical strength between them, but he allowed himself to be elbowed aside without a word of protest, and shrank back timidly while the clerk turned to the desk and greeted the more aggressive late comer first. What is the explanation of the conduct of these two men? Simply that the big man did not feel sure of himself; he was in surroundings which were unfamiliar to him, while the little man was wholly at home. It is the same instinct which makes the country dog which has followed his master to town, turn tail from his city cousin until he reaches the shelter of the master's wagon, when he faces his pursuer and stands at bay.

The lesson I wish to draw from these illustrations is this: A serious part of the work of the teacher is to acquaint the pupil with his environment; to make him master of the natural phenomena with which he is surrounded, so that he need not be at loss to know how to make them serve him. Since the Almighty placed our common ancestor, Adam, on this world with the command to take the earth and subdue it, man has striven to learn the secrets of Nature and to use the resources of earth, sea, and air for his own comfort and support. In part, he has been successful, yet how many of us, if cast away like another Robinson Crusoe, could hold our own in the struggle for existence? How many of us, when walking in the fields, hesitate to pluck the brilliant flower which blooms in our path, or to taste the tempting berries which the bushes hold forth to us, for fear they may be poisonous? The lesson is obvious. To paraphrase an old proverb—it is this: "Familiarity breeds confidence."

No one can be wholly successful in life who is the victim of discontent. I mean by this not the kind of discontent which sees in society conditions which are unjust and seeks to right them; this is the kind of discontent that is productive of "insurgents." I mean rather the discontent that sees no beauty in the fairest landscape, but only trees and bushes; that hears no music in the singing of the birds, but only shrill noise. There are people who live amid scenes of the greatest beauty yet who wonder why tourists come to look on the rocks and hills with which they are surrounded. I have been told of people who have lived for years within sight of the Congressional Library in Washington—that building which is said to have the most beautifully decorated interior of any building in the United States—yet who have never entered its portals. These same people doubtless complain because they cannot afford to take a trip to New York or Paris to see the sights. Here, then, is another part of the work of the educator—to teach an appreciation of one's immediate environment, and to stir up an interest in Nature's phenomena with which every one is surrounded, so that no matter where one finds himself, there is always something to entertain and instruct him. The ideal is that of Him who found "Sermons in stones and books in the running brooks."

THE PLACE OF FORESTRY IN PUBLIC SCHOOL EDUCATION.

You will readily perceive from what I have said why I have the temerity to suggest forestry as a subject for study in the public schools. Forestry is in no sense to be considered an unwelcome intruder begging to be admitted to the select company now comprising the public school curriculum. The guest chamber is already over-crowded, and there is no room for additional occupants in the places of honor. Forestry asks nothing more than admission to the servant's quarters. It desires only to serve, and in the role of a good

servant, is glad to efface itself and lose its identity in order that its superiors may appear to better advantage and thus become more attractive. It seeks not to *supplant* but to *supplement*.

While forestry furnishes material which is of the utmost value as supplementing many subjects, such, for example, as geography, history, botany, and civics, its special place is clearly as a part of nature study and agriculture. In the primary grades, the cultural qualities and the element of scientific observation which enter into the study of forest conditions are of great value in training young children to think clearly and observe accurately. In the upper grades and the high school, forestry again appears, this time as a very vital part of agriculture. The woodlot is coming more and more to be recognized as an essential part of every well-organized farm, and the products of the woodlot to be considered as one of the important farm crops on the same basis with wheat and corn. From an economic standpoint, the lessons of the woodlot are too significant to be omitted. May I suggest that any text-book on agriculture which does not include a chapter on the woodlot is, to that extent, incomplete.

Now let us consider for a moment the advantages of the forest as a source of illustrative material. The study of trees is quite common in the public schools, but some times we see so many trees that we lose sight of the forest. The forest should be studied as such to be of the greatest interest. It is rich with interesting examples of the phenomena of plant and animal life. It is as though the Book of Nature were here issued in folio sized edition, printed in long primer type, for everything is built on a life-sized scale in the forest, so that he that runs may read. The teacher of botany or geography who is content to point out the pictures in the text-book, yet never takes the pupil outdoors to see the real thing depicted by the picture, deprives the pupil of a great opportunity which lies just over the brow of the hill.

In this fact, that except in a very few localities, the forest does literally lie just over the brow of the hill, lies one great advantage of forestry as a supplemental part of school work. There are few regions of the United States in which some forest features are not close at hand to be studied. Where there is no group of trees that could be dignified with the name of forest, there is at least the tree to study individually. Even in the most crowded city, there are parks to be visited, and I am glad to note the increasing tendency to at least simulate natural forest conditions in these parks and to break away from the stiff artificiality which has been characteristic of city squares and parks hitherto. Even the treeless regions of the western plains furnish ground for the solution of one great problem of the forest—that of afforestation, or tree planting with a view to producing forests.

Again, the teacher who wishes to study the forest, or to make use of the illustrative material which it furnishes, need not wait upon the seasons—the forest is always ready to be studied; it is never out of season. The tree, unlike the flowers or vegetables studied in school gardens and otherwise, does not disappear during the winter. On the contrary, a great many of the most interesting phases of tree life and forest conditions can be studied best in the winter, just at the season when most other forms of plant life are unavailable. This applies especially to the winter buds and protective coverings of the trees, their forms and branchings.

But the forest does not rest its claims for recognition as a candidate for educational consideration upon its botanic importance alone. It also begs to present itself as worthy of consideration from an economic standpoint. The products of the forest enter largely into the commercial life of the nation. Everywhere, despite the disastrous experience of Mother Eve, the fruit of the tree is being constantly partaken of by the sons of men. A thousand articles of

commerce, raw and manufactured, are daily the basis of trade in our markets and affect our lives at every turn. This is too important to be overlooked if the school is to teach what is going on in the world. No teacher of commercial geography, history, or arithmetic can avoid the consideration of problems and questions which deal with the forest and its products. Then, aside from the articles of commerce produced, the forests are coming more and more to be recognized as having an important influence upon the economic development of the country through the influences they exert upon climatic conditions, soils, and water supplies.

In view of all these facts, it seems to me well worth while for the teacher who wishes to make the work of the class room at once broadly instructive, entertaining, and uplifting, to draw freely upon the forest for material to illustrate and intensify the studies of the school.

FORESTRY IN NATURE STUDY.

The tree has long been a favorite subject for nature study. It has so many points of interest, so many phases in its yearly life and is so constantly and universally available that it is invariably drawn upon by teachers looking for illustrative material. Each tree seems to have its own particular effect upon our feelings. The oak, for example, impresses us with its strength, the elm with its grace, the weeping willow with a sense of humility or sorrow.

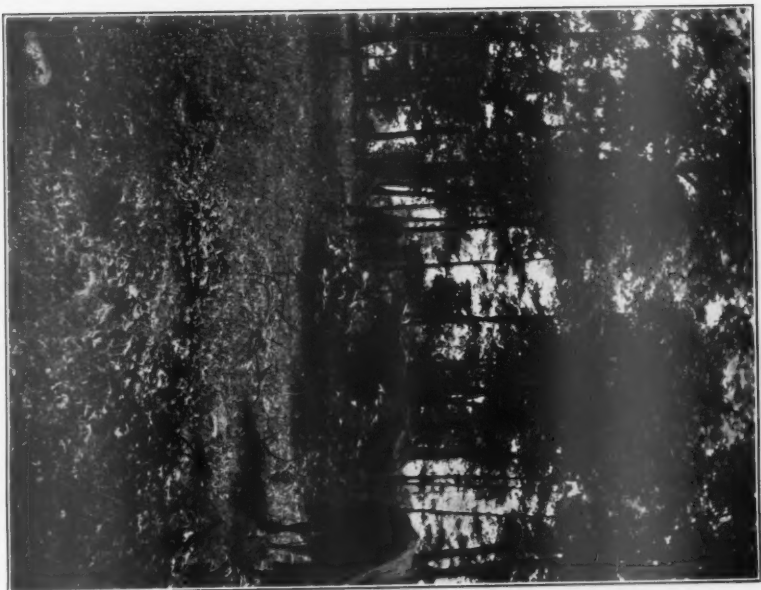
We find a new cause of interest in the tree as the seasons change and with the coming of winter the leaves fall away, leaving the branches bare. Winter affords the best opportunity to study tree forms. An old chestnut or elm, for example, will show plainly the deliquescent or dissolving type of branching, while the poplar or cedar are types of the excurrent form.

The student of nature study will want to know how the tree grows, and an interesting experiment is to dig and wash away the soil from the roots of a small seedling and learn by actual measurement how far the roots extend. Then occasionally in the forest we may find a large tree uprooted by the wind and see how the roots penetrate and hold the soil. No better evidence can be had as to the value of trees in preventing erosion.

Considering the parts of the tree found above ground, we may compare the erect and self-supporting trunk to the stems of vines and herbs. When we study the growth of the tree, no more striking evidence of this growth can be found than the fresh shoots of the evergreen's branches as they appear in the spring.

Now let us leave the study of the individual tree and consider the forest. Here we find not only trees to study but whole colonies of smaller plants and of animals which go to make up the life of the woodland, and there are also for consideration a great many conditions of soil and water supply that depend upon the forest. We need to observe, for example, how the forest floor is interwoven with roots and enriched by the humus of vegetable decay. This can be easily seen in some place where the forest floor extends to the edge of a bank and is thus shown in vertical section.

One of the most important lessons we may learn from the forest is the appreciation of beauty, not only of form but of color. No where can we find such rich and delicate colorings, such a variety of tints and such a procession of changes as our common hardwood forests produce with the changes of the seasons. When the season is mild and Jack Frost does not spoil the show, the autumn leaves set forth for our enjoyment a perfect symphony of color not excelled anywhere in nature. Even stern winter entering upon the stage cannot entirely quell the joyous riot, for the sturdy conifers in their coats of green stand erect amid the snows and continue to play their parts unmindful of the sharpest cold.



UTILIZING THE WOODLOT FOR GRAZING
PURPOSES PREVENTS REPRODUCTION



"WINTER AFFORDS THE BEST OPPORTUNITY
TO STUDY TREE FORMS"

LESSONS FROM THE FOREST



THE SQUIRREL IN HIS TRAVELS
THROUGH THE TREE TOPS



LESSONS FROM THE FOREST

"THE STURDY EVERGREENS STAND ERECT
AGAINST THE SNOWS"



"A LARGE TREE UPROOTED BY THE WIND SHOWS HOW
THE ROOTS PENETRATE AND HOLD THE SOIL."



LESSONS FROM THE FORESTS

A COMMON TYPE OF WOODLOT—THE WINDBREAK



THE WOODLOT HAS ITS PLACE ON THE FARM,
AS WELL AS THE GRAIN FIELD



LESSONS FROM THE FOREST

"THE STUDENT OF GEOGRAPHY SHOULD KNOW OF THE EXTENT
OF THE TREELESS REGIONS OF THE MIDDLE WEST"

It would be both unfortunate and unwise to study the forest without also studying some of the fascinating creatures that inhabit the wildwood. We may watch the squirrel in his travel through the tree tops; the woodpecker, rapping as it were, for admission on the wooden door of the tree trunks or boring holes in the bark as a cache for his winter supply of acorns. We may, if we are bold enough, even venture into the realms of those larger and more ferocious creatures of the woods, such as the bear and wolves. All these go to make the story of the forest one of intense interest to the child.

Before I leave the subject of nature study, I wish to emphasize again the importance of the tree from an aesthetic viewpoint. I need only to remind you of the beauty of a city street lined with beautiful trees to impress upon your minds what you already know—namely, the importance of trees in the beautification of cities. And what can possibly plead more strongly for the cause of the tree than the contrast so often seen of two school houses, situated within a few miles of one another, the first with grounds absolutely barren and uninviting; the other nestling cozily among shady maples, which shelter it in winter from the storms and furnish cool shade in summer?

FORESTRY IN AGRICULTURE.

Possibly the most important phase of the study of forestry in so far as it is applicable to the public school is found in its application to elementary agriculture. We are coming more and more to realize that the woodlot is just as essential to the organization of the farm as the cornfield or the alfalfa patch; the products of the woodlot are just as much to be considered farm crops as grain or hay. Some farms are fortunate enough to include native timberland, but in the prairie states, more often, a plantation is necessary. The difficulty to be overcome in establishing a woodlot is that agricultural land can be made more immediately profitable for the production of other crops than if planted to trees. The student of agriculture will at once see that one function of the woodlot is in the utilization of waste lands, such, for example, as are subject to erosion or cut off from cultivation by streams or other topographical obstructions. It is well to realize also that trees will almost invariably grow on soil too poor or too rough to support any other crop. This is true also of sandy soils, where trees will not only thrive, if proper species are selected, but will also prove useful in preventing the shifting of sands by the action of winds.

Perhaps the most common as well as the most useful type of woodlot plantation found in the Middle West is that which surrounds the home of nearly every prairie farmer. This type combines the advantages of the wind-break or shelterbelt, to that of the crop-producing woodlot. Its advantages are so obvious that argument is really unnecessary to convince any student of agriculture of its importance to the farmer.

Study for a moment the utilization of trees as a protection for the orchard. This is especially important in those regions where there are prevailing winds which will invariably distort and injure the fruit trees if they are unprotected. But the woodlot cannot be left to itself without cultivation or care if it is to be successful. The first thing, of course, to be considered in establishing a plantation is proper planting methods. One common fault in tree planting for woodlot purposes is that often too much space is left between the trees. A plantation will not thrive when the trees are too wide apart to afford mutual protection, while a plantation closely planted will usually produce the best type of tree for posts, poles or lumber because of the clear straight boles which the trees develop.

It is the custom in many places to utilize the woodlot for grazing purposes. This gives bad results in two ways. It prevents any possibility of

reproduction; and the trees are subject to injury by having the earth trampled away, exposing their roots and thus interfering with their growth. If the trees are young, it is the height of folly to allow cattle to graze among them, for the tops will be eaten back and the trees become twisted and broken from the rubbing and trampling they will receive. This fact is witnessed by the ruins of many a school ground plantation.

The greatest enemy of the forest tree is fire. Fire may not so frequently find its way to the woodlot as to the forest primeval, but it is nevertheless to be reckoned with; not the great, flaming all-consuming forest fire, but the creeping, seemingly insignificant ground fire which burns slowly through leaves and humus. A furrow around the woodlot will frequently serve as an efficient protection from such fires and prevent much damage.

The proper utilization and management of the woodlot is a broad subject. I shall have time only to mention a very few points. Proper cutting and judicious improvement thinnings are essential to promote the best development of desirable trees, especially if the woodlot is of native growth. In some types of woodlots, pruning is advisable, but frequently this will be unnecessary if not unwise. The most important feature is, of course, the harvesting of the crop of the woodlot, which will consist, so far as the ordinary farmer is concerned, of fence posts, fuel, poles, etc. A great many problems present themselves which cannot be solved satisfactorily except by a knowledge of silviculture and technical forestry. The students of agriculture may well become familiar with the fact that in such cases, advice may always be had at little or no cost from the Forest Service of the United States Department of Agriculture.

The essential points which I wish to impress upon all teachers of agriculture is the importance of the consideration of trees as a farm crop just as much as corn; and that the forest, in the form of the woodlot, has its place in agriculture which we cannot afford to overlook.

FORESTRY IN BOTANY.

The student of botany will, of necessity, make the tree the subject of a great deal of study. It is the best type of exogenous, or outside growing plant. The annual rings of the tree contain many an interesting story of the vicissitudes of its life history. We might dwell upon this interesting point for a long time but I must pass on. One type of inside-growing or endogenous tree is found in the palm family. It will interest the botanist to compare the form of the palm to that of ordinary outside growing trees and seek explanations for the differences.

The life processes of the tree are full of mystery and of interest to the student. We shall find it profitable to learn why a girdled tree dies in a season, but one whose entire trunk, except the bark and sapwood, has decayed will often thrive with no signs of injury for years, until blown down by some wind storm.

In considering that most fascinating of botanical subjects, seed dispersal, the trees furnish us an infinite variety of studies. We might collect and study the winged seeds such as those of the maple, elm, and basswood. The reproduction by seeding is well worth our attention, but we must not overlook that other type of forest reproduction, the coppice or sprout method, for this is not only interesting as a botanical study, but important from the side of forestry.

Should we consider the ecology of the forest, we find the light relation of trees evidenced in striking manner by the self-pruning of forest trees in comparison with the wide lateral branches developed in the same species where grown singly in the open. It is also clearly shown by the rapid reproduction which sets in when a clearing is made in the forest and the quick upshooting

of the undergrowth when it finds the upper story of the trees that cut off the light removed. Possibly the feature of the forest which is most unique and interesting in the study of light relations is the classification of trees into "tolerant" and "intolerant" species. To illustrate, we find the intolerant but quick-growing aspen rapidly covering burned or cut over areas, but it ultimately has to yield to the slow-growing but tolerant fir. The lesson which might be drawn from this natural phenomenon of the forest is obvious, but I am not given to appending morals to my stories.

Another ecological phase of forest life is found in the study of water loving types of trees which form the tree societies that line the banks of streams. Compare this with the effect of flooding upon similar trees, and we find the tree to be very temperate in its habits—it cannot stand too much to drink.

Again, temperature relations are shown by the appearance of the forests at timber line on mountain sides; and soil relations by the stunted growth of trees in poor soil as upon bare hills or when, perchance, a seed finds lodgment upon granite rocks where there is almost no soil for it to feed upon.

I remember that in the back of the text-book on botany which I studied, there was a chapter which was never looked into by students and which the teacher evidently did not care to tackle. The entrance to this chapter was guarded by a Cerberus-like word so formidable in its appearance that we never even attempted to find out what was concealed in those pages. The word was "Cryptogamia." Many of the members of the family of plants designated by this formidable name are found in the forest. I wish merely to introduce you to one—a riotous, destructive chap whose given name is "Fungus." If your excursions into the realms of botany are extensive enough, you may spend many hours studying the destruction wrought by fungi in the forest. Let us not altogether condemn him, however, for he is the scavenger which cleans up the aisles of the forest cathedral, and tears apart the fallen trunks of the monarchs of the forest, returning them to the dust from which they sprang, thus enriching the soil with humus and helping in a very important work of the forest.

FORESTRY IN GEOGRAPHY.

It would hardly be wise to close this rather hasty outline without adding a word as to the importance of the consideration of the forests in the study of geography. It is of the utmost importance that the student of geography should know something about the classification of lands in the United States and their value and productive powers. It is also desirable that he should know something of the forest resources of the United States, where the chief sources of our pine lumber and our hardwood supply are now found and about the rapidly vanishing redwoods and big trees of the Pacific Coast. He should know about the extent of the treeless regions of the Middle West and the deserts of the Southwest, where only cacti and sage brush grow.

The lumber industry, the fourth industry of the country in commercial importance, is treated in every geography worth mentioning and is full of interest in all its varied phases from the taking of the logs from the forest through the sawmill and lumber yards to their final utilization. But lumber is not the only product of the forest worthy of consideration. The long-leaf pine produces turpentine; spruce and poplar are used to make wood pulp for paper manufacture; the hemlock and tanbark oak are stripped of their bark for the tanner; and we are even paving streets with wood blocks very successfully. Each of these industries which I have briefly touched will furnish material for weeks of study if followed up in all its phases.

In closing I wish to present a subject which has lately come into great prominence in the affairs of the land, namely, the necessity for the preservation of the forests for the future benefit of the nation. Destructive lumbering and wasteful use have wrought havoc with the forests. Forest fires have swept over thousands of acres of timberland, destroying not only the trees but even eating out the rich soil, the accumulation of ages. There follows the washing away of unprotected soil on deforested slopes and destructive freshets which cover the lowlands with deposits of sand and mud. To prevent this waste of the wealth of the nation, Congress has established the National Forests. The spirit which controls the administration of the National Forests is set forth in these words—*Careful use*. The rangers who patrol the forests are there to protect them from misuse and destruction. Thousands of head of live stock are grazed on these forests every year, but the number per acre is carefully limited so as to protect the range from permanent injury. Legitimate mining is encouraged, but miners are forbidden to take up mining claims solely to secure the timber which may be found on it. Water power is not cut off from use, as is often stated, and lumbering is carried on, but under the supervision of trained foresters who see that all trees cut are closely utilized, provision made for leaving seed trees to insure reproduction, and the brush properly burned so as to minimize the danger from fires. All these features should be known to the student of geography, for in them lies the real reason why geography is worthy of a place in the public school curriculum; it is the study of man in his relations to his environment.





LESSONS FROM THE FOREST

THE HOLLOW TREE WILL THRIVE FOR YEARS



TOLERANT AND INTOLERANT TREES—AN INTERESTING
STUDY IN LIGHT RELATIONS



LESSONS FROM THE FOREST

WATER-LOVING TREE SOCIETIES THAT LINE
THE BANKS OF STREAMS



LESSONS FROM THE FOREST

ONE MAY SPEND HOURS STUDYING THE DESTRUCTION WROUGHT BY FUNGI IN THE FOREST



LESSONS FROM THE FOREST

THE GREATEST ENEMY OF THE FOREST TREE IS FIRE

FORESTRY PROGRESS IN NEW HAMPSHIRE

By W. R. BROWN

SECRETARY OF THE NEW HAMPSHIRE FORESTRY COMMISSION

THE history of the inception and growth of forestry in New Hampshire of the measures and the men behind it, and of its present outlook, may be of general interest because, in a degree, it is typical of the growth throughout the country, and because the state is beloved of many; and of especial interest because of the attention that has been drawn to its remarkable mountain country by the movement for the establishment there of national forests.

Being naturally a wooded state, with forests that came well down to the shore of the ocean, and possessing an immense power of reproduction, the practice of forestry was not taken up in New Hampshire until after the Civil War. The great number of summer visitors, however, who came for the enjoyment of the wonderful scenery; the establishment of large lumber and pulp industries in the north; and the rapid increase of the portable mill, which diminished the stand of splendid pine that grew so abundantly in the middle and southern parts of the state, were the factors which brought the matter into the minds of a few thoughtful men after the state had sold its last timberlands in 1867.

One of the New Hampshire men to first conserve and replete was Honorable Isaac Adams, who, in 1878, planted a tract of forty acres in the town of Moultonboro to white pine in parallel rows four feet apart each way. This plantation may be seen today, although it has suffered for need of thinning.

Originally two-thirds of New Hampshire's total area, or 4,000,000 acres, was in timberland, much of it virgin growth, but through the abandonment of old farms and their reversion to sprouts, this has since been increased so that now three-fourths of our state is covered by growth of some kind. The depreciation in the quality of the stand was the cause of chief concern to far-sighted citizens, as cut over lands replaced old growth, burned areas came up to cherry bushes, and old pastures became improperly seeded. Over the northern section of the state the most characteristic species, spruce and balsam formed vast unsettled forests which covered the mountains almost to their tops, and were treated as unlimited reservoirs by the large lumber and pulp companies and cut without attention to reproduction, while in the southern half where deciduous trees were in preponderance, accompanied with the white pine, the country was opened by settlement, with the characteristic woodlot left on the farm. Two distinct problems were therefore offered for the practice of forestry. First, protection against extensive conflagrations in the north calling for a broad policy to protect a large area, together with the encouragement of a disposition to leave small trees standing; and second, in the south the organization of each separate town to fight local fires, with encouragement to replant the cleared lot, and perpetuate the rapid growing and profitable white pine.

Sometime in the seventies the old growth forest in that part of the Ammonoosuc Valley between the Twin Mountain House and Fabyans, and extending along the road from Fabyans to the Crawford House and westward to the base

of Mount Washington, was cut and completely burned and this loss of a much prized and well known region coupled with the growing interest to protect and conserve led the legislature in 1881 to appoint the first state forestry commission, consisting of Governor Hale and seven others, chief of whom was the Hon. Joseph B. Walker, who had worked assiduously in the state senate for its creation, helped largely in its investigations, and finally wrote out its findings in 1885 in an excellent and far-seeing report on the following subjects: (1) The area of forests; (2) their relation to the rainfall and climate; (3) trees and shrubs found therein; (4) forest management; (5) reforestation. Their report being finished they disbanded.

After the report of the first forest commission in 1885 nothing further was done until 1889, when the Governor and Council appointed a second commission, consisting of Joseph B. Walker, George B. Chandler and J. B. Harrison, who made a report in 1891, and forestry bills were introduced embodying their recommendations. Favorable action was not secured until 1893, when the legislature passed a law which created a forestry commission, to consist of the governor and four members, to investigate the extent and character of the original and secondary forests in the state; the removal and disposition made of the woods therefrom; all revenues derived; the damage done by fire; methods of lumbering pursued, and effects on the timber supply, water power, scenery and climate. This commission, which consisted of George B. Chandler, Napoleon B. Bryant, James F. Colby, and George H. Moses, got out the first official forestry map of the state, and for a few years thereafter laid the foundation of fact upon which to base a proper forestry policy. Little or no money was appropriated and the work done was left to the patriotism and loyalty to the cause of these men to awaken public interest. In 1895, however, the legislature empowered the commission to pay through the county one-half of the cost for fighting fire in unincorporated places, the other half to be borne by the owner, and passed more stringent laws against the setting of fire. They succinctly illustrated the general feeling of the times in their second annual report under the chapter heading: "Lumber vs. Forestry," and found their first problem to demonstrate the mutual interests which should bind the two.

Probably no one did more for the solution of this problem than Mr. Austin Cary, who commenced an exhaustive study of the northern spruce under the direction of Dr. B. E. Fernow, then head of the Forestry Bureau of the United States Department of the Interior. Mr. Cary applied himself to the practical solution of adapting foreign methods to American conditions; of demonstrating the practical value of conservation to pulp and lumber companies, and of securing the first practical cutting according to forestry methods. His careful research also of the insect and fungus enemies of the northern woods was of much scientific value. Up to the eighties lumber companies had cut only the larger trees for saw logs and unwittingly had left a considerable stand for future growth and reproduction. Upon the first advent of the pulp companies, however, this condition was changed for a period to a strip cut, and Mr. Cary's demonstration of the ultimate unprofitableness of this procedure was of inestimable value to the state. Studies by Henry S. Graves and others in 1894 of spruce under Adirondack conditions supplemented his work and a meeting of the American Forestry Association at Plymouth August 24, at which Joseph B. Walker, and George B. James spoke, aroused national interest in New Hampshire's problem, and an offer of co-operative assistance was made in 1898 to interested owners of woodland by the Division of Forestry, Department of Agriculture, at Washington, then under Gifford Pinchot.

In 1901 the legislature authorized the appointment of discreet persons by each town to control and protect the shade trees on the highway and tag them with a New Hampshire tag. It was unfortunately afterwards found that, however discreet such tree wardens might be, this act as it stood, was unconstitutional if contested by abutting owners. But as provision was made also for purchase and contest was not frequent, it has been of very material service in the protection of shade trees.

In 1901 the Society for the Protection of New Hampshire Forests grew out of the general interest. The first president was ex-Governor Frank W. Rollins, Joseph T. Walker was secretary, and Gen. George T. Cruft, treasurer, Philip W. Ayers was and is the forester of the society. Allen Hollis of Concord, succeeded Mr. Walker and is now the secretary. The society started with 230 representatives and distinguished members, numbering among them Edward Everett Hale, who, as a young man in 1825, helped in the first survey of the state to run town lines over the ragged peaks of the White Mountains, and was throughout his life a warm exponent of all that made for the protection of their forests and scenic beauty. It has continually added to its numbers and resources and has obtained strong support from outside the state, especially from the neighboring commonwealth of Massachusetts. Its unofficial nature and consequent freedom to act and advise has enabled it to become one of the most potent factors towards progress in the state. The purpose shown by its initial constitution was:

To encourage forest growth.

To disseminate knowledge upon planting, managing and harvesting the forest crop.

To establish a nursery for distributing small trees and seed.

To establish demonstrating forests.

To preserve scenic places and high and steep slopes of mountains.

To conserve growing forests and secure legislation.

Since its establishment it has given especial encouragement and aid to scientific reproduction of the forest and maintained its own nursery; has advocated state control, state forests, larger co-operation with the federal government and other forestry associations, and its annual meetings, which have lately been held in the White Mountains during the summer season, have brought together many distinguished guests and visitors. Working plans for improvement cutting have been made by Forester Ayres for many institutions throughout the state, such as the Concord Electric Company, Concord Water Works, and St. Paul's School. The care of the Dartmouth College grant of 26,000 acres was placed in his hands. The society has recently been made trustee for the residents around Lake Sunapee of a forest reserve of 700 acres on Sunapee Mountain, which was generously purchased and given by Herbert Welch and Mrs. Covill of Philadelphia, Mrs. John Hay of Washington, and Richard M. Colgate of New York.

Nineteen hundred and three also saw the commencement of the agitation for a national forest reserve in the White Mountains, largely through the influence of this association. Through the efforts of the Forestry Commission resolutions passed the legislature giving consent and approval to any action to establish such a reserve by Congress. Senator Gallinger presented a bill in the Senate in December, 1903, to the 58th Congress. This was favorably reported on from committee by Senator Burnham at the second session, but was not brought to vote before the opening of the 59th Congress. A bill which had subsequently been drawn up to combine the White Mountain reserve and the Southern Appalachian reserve was introduced again in the Senate by Senator Gallinger and conjointly in the House by Representative Currier. This passed the Senate but was held up in the House Committee of Agriculture. The supporters of the bill obtained a two days' hearing before this committee

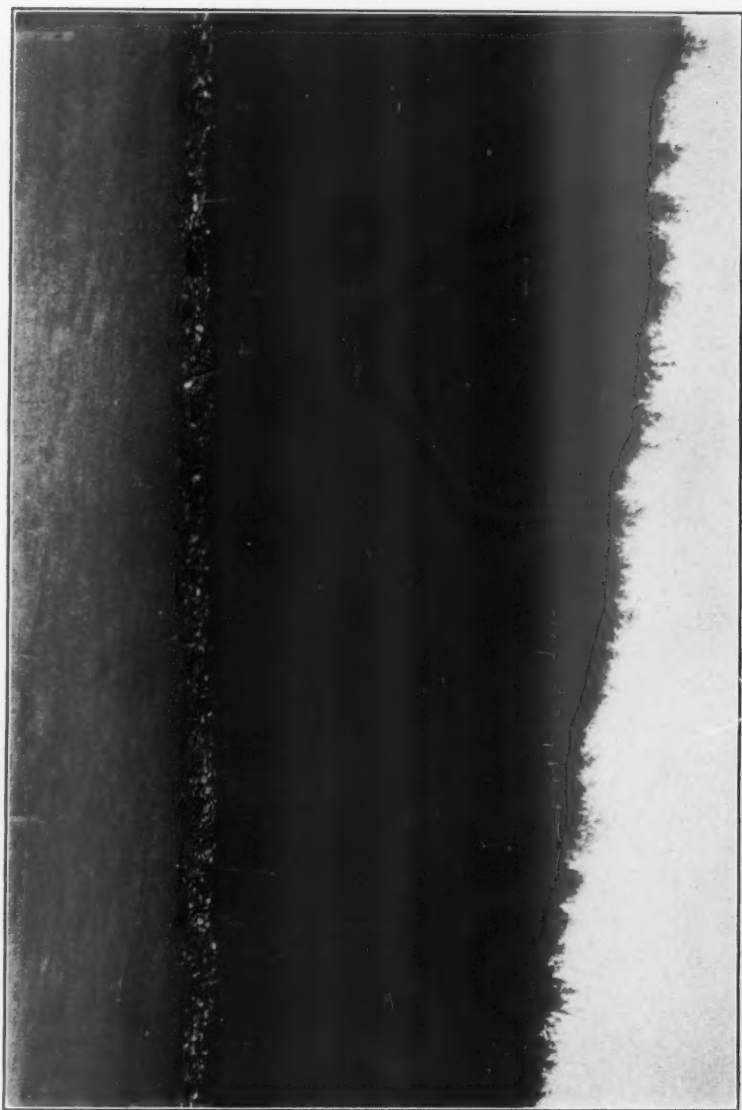
at which Governor Glenn of North Carolina headed the petitioners, and New Hampshire had Governor McLane as its spokesman, together with the secretary of state, council and members of the legislature and officers of the Society for the Protection of New Hampshire Forests. Both the Governor and Mr. Harvey N. Shepard of the Appalachian Club, spoke eloquently in its favor. The committee reported the bill favorably to the House, but it was held up by the Speaker until the House adjourned. Since then another modified bill has twice passed the House and is slated to be taken up by the Senate at the coming session.*

In 1903, through the joint efforts of Philip W. Ayres, for his society, and the commission, which then consisted of Henry O. Kent, George E. Bales, Marshall C. Wentworth and George H. Moses, an appropriation of five thousand dollars was obtained for a forest examination of the White Mountain region and the completion of the forest map which was commenced in 1893. This examination was prosecuted during the same year by Mr. Alfred K. Chittenden of the United States Forest Service, who made a most excellent and exhaustive report on the character of the more important trees and of the conditions necessary to their successful reproduction. His study of the lumber and pulp industries, of the farmers' woodlot, of forest planting, and his recommendations thereon, proved to be a classic of complete and wise advice, and laid down the fundamental lines along which all of the subsequent progress has been made. In conjunction with his work a study was made by N. C. Grover and H. K. Barrows of the United States Geological Survey of the hydrography of the White Mountain region. This investigation began the compilation of many tables on stream flow but was abandoned because of the time necessary to secure sufficient data. Owing to the cutting off of the appropriation for the purpose the work of stream measurements was stopped throughout New England, thus making practically useless the data already obtained, since observations for long terms of years are necessary to attain any results of scientific value.

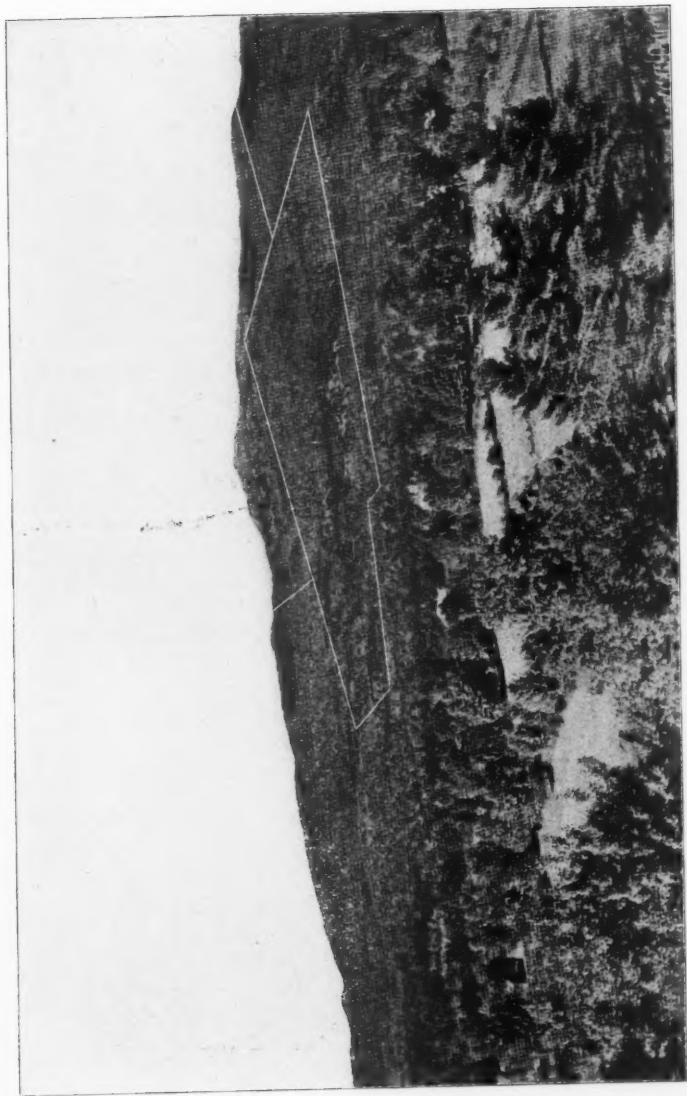
Another important report upon the forest and water conditions of Northern New Hampshire was embodied in the report of the Secretary of Agriculture to Congress, under the act of 1907, appropriating \$25,000 for an investigation of the Southern Appalachian and White Mountains, with reference to the proposed national forests. This report was prepared under the direction of William L. Hall of the United States Forest Service, and the material was gathered by the united work of Forest and Geological Survey experts, making a valuable contribution to the knowledge of the conditions and opportunities of this region. In this connection may be also mentioned the report issued in November, 1909, by co-operation between the New Hampshire Forestry Commission and the United States Forest Service. This was an accurate and comprehensive study of the "Commercial Importance of the White Mountain Forests." It was prepared by Philip W. Ayres, Forester of the Society for the Protection of New Hampshire Forests and issued as Forest Service Circular 168 by the United States Department of Agriculture.

The first public land under the new conditions came to the state through the exercise of their right of condemnation and purchase under the law, through the generous gift by Joel H. and Arthur E. Poole of Jaffrey, and Isaac Sprague of Boston, who made an offer of \$8,000 for the purchase of 500 acres on the side of Mount Monadnock in the town of Jaffrey, which is now held as the state's first public park.

*A detailed account of "The Fight for the Appalachian Forests," by Edwin A. Start, was published in this magazine, then known as *Conservation*, for May, 1909. That article preserves the record of the hearings and of the succession of bills and their history up to the close of the Sixtieth Congress.



WHITE PINE FOREST PLANTED THIRTY-FIVE YEARS AGO
ON STEEP BARREN WEST SLOPE



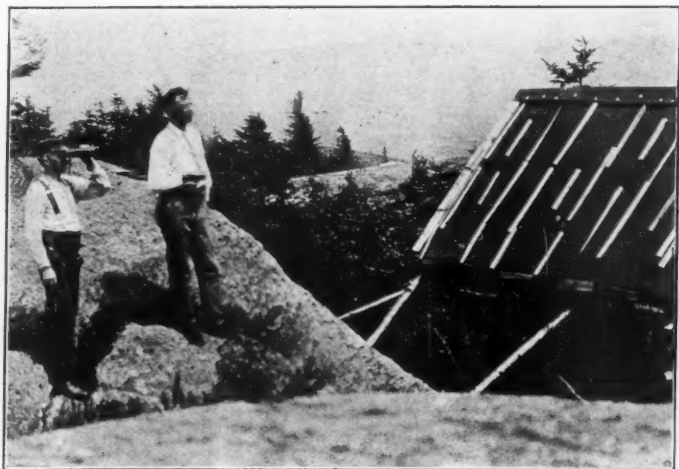
MT. MONADNOCK, NEW HAMPSHIRE, THE LINES
SHOWING THE STATE PARK



DENSE YOUNG GROWTH OF SPRUCE ON OLD
PASTURE, NORTHERN NEW HAMPSHIRE



DENSE REPRODUCTION OF PINE ON AN OLD
PASTURE, SOUTHERN NEW HAMPSHIRE



A MOUNTAIN FIRE LOOKOUT STATION IN MAINE



WHITE PINE TRANSPLANTS IN NURSERY OF NEW HAMPSHIRE
FORESTRY COMMISSION, PEMBROKE, N. H.

In 1905 Jason E. Tolles and Robert P. Bass were appointed on the forestry commission and the fire law was revised to make the chief of the fire department in each town responsible for the extinguishment of brush fires, as forest fire warden. Penalties for setting fire were made more severe, but the towns or owners still paid all bills.

In 1906, through the generosity of Gifford Pinchot and department, an additional study was made possible in the southern half of the state to supplement the work done by Chittenden in the north, and Charles A. Lyford, M. F., and Louis Margolin, F. E., conducted investigations and prepared tables on the growth of white pine, of particular scientific value to the whole country, giving the rotation and the expectation profit from planting, and data to show its advantage as an investment. Their report also showed the growing need of reform, especially in the southern part of the state, in the manner of taxing forest lands and the inequalities and abuses of the present system and laid down the general lines upon which procedure should be made towards exemption.

In 1908 the state received an additional gift of the reservation of 60 acres of pine in the town of Jaffrey, generously made by Miss Frances A. L. Haven of New York City.

Robert E. Faulkner of Keene, served on the commission as its secretary in 1907-1908, and by the disinterested gift of his salary made possible the establishment of the first mountain lookout fire station in the state. In the same year the commission, with the active co-operation of the United States Forest Service, instituted an investigation of the taxation of forest lands, and the efficiency of the fire laws in New Hampshire, and much original data was secured of great value in the scientific study of the taxation problem, both in the state and country at large.

Through the efforts of many clear-sighted, unselfish citizens, of the able members of the forestry commission, and not least of the Society for the Protection of New Hampshire Forests, the subject of scientific forest management and development, had by this time come to be a recognized public economic question of the highest importance.

Largely through the efforts of Mr. Robert P. Bass, then a member of the commission, the legislature of 1909 passed a much enlarged and improved forestry bill, which called for a smaller commission, a state forester, reorganization of town fire wardens, and the state to share expense conjointly with the towns in fighting fire. Provision was made for educational and protective work, but the amount appropriated by the legislature was insufficient to cover anything but the actual expense of putting out fires and maintaining the department. Mr. Robert P. Bass, Mr. Jason E. Tolles and the writer, were appointed on the new commission authorized by this law. Mr. E. C. Hirst of the Yale Forestry School, was appointed state forester. Two hundred and twenty-five town fire wardens were then appointed by the state forester. Bulletins were issued and lectures given. A call for a meeting at Gorham, N. H., in March, 1910, of the large timber land owners, was widely attended and addresses showing the advantages of co-operation and combination in reducing fire risk were made by William T. Cox, assistant forester of the Service at Washington, E. E. Ring, forest commissioner of Maine, A. F. Hawes, forester of Vermont, Austin Cary, superintendent of state forest lands of New York, and E. C. Hirst, forester of New Hampshire, and a subscription was secured which enabled the state forester to establish and maintain during that summer fourteen mountain fire lookout stations over the northern forests of the state. A small state nursery was started by the members of the commission personally, and the general interest in this was evidenced by orders coming in almost immediately for more than its total production. It is hoped that this nursery will be taken over and provided for by the state.

MOUNTAIN LOOKOUT STATIONS OF **NORTHERN NEW HAMPSHIRE**

SCALE OF MILES
0 1 2 3 4 5 6 7 8 9 10

Stations shown thus ○

- 1 Magalloway Mountain
- 2 Aziscohos Mountain (Maine)
- 3 Signal Mountain
- 4 Sugar Loaf Mountain
- 5 Black Mountain
- 6 Pine Mountain
- 7 Mt. Madison
- 8 Mt. Rosebrook
- 9 Mt. Agassiz
- 10 Mt. Kearsarge (Bartlett)
- 11 Mt. Carrigain
- 12 Mt. Osceola
- 13 Mt. Moosilauke
- 14 Croydon Mountain



Through the activity of the town fire wardens the state's legal department was able to secure the trial and conviction of a few cases of incendiarism. The first annual convention of town fire wardens for mutual co-operation and exchange of ideas was held at Bretton Woods during the first week of August, 1910, in conjunction with the annual meeting of the Society for the Protection of New Hampshire Forests, and addresses were given by Governor Quinby, R. P. Bass, chairman of the commission, the state foresters of Massachusetts, Vermont, New Hampshire and others. In October, 1910, the timberland owners effected a permanent organization for further protection and co operation along the lines of the western protective associations.

Much, however, remains to be accomplished. As fire protection is distinctly a function of the state the advisability of establishing four general fire districts and a paid district chief over each, is felt to be much needed. The district chief, working under a salary, can organize the town fire wardens in his section and take many necessary measures towards prevention. An additional appropriation is needed for paid patrol during the fire season, tool and provision supply storehouses, maps, construction of fire trails and fire lines, and an addition to the number of mountain fire lookout stations. More stringent methods are thought to be necessary to reduce the frequent cause of danger from locomotive sparks and the burning of brush. An enlargement of the state nursery is called for by the demand for seedlings. The excellent New York state law requiring the lopping of the branches from the felled tops of soft wood trees, so that the stem falls to the ground, should be carried out. Small lots for the practical demonstration of forestry methods should be established at different points throughout the state, and special emphasis laid on the need of intensive cultivation of poorly productive forest land, and the conservative cutting of the existing stand for the future conservation of one of the principal industries of the state, lumber, paper and pulp, and the reservation of her scenic attractiveness for the protection of the rapidly growing summer business. Especially should interest center upon the preservation of what we now so richly enjoy in the way of natural forest reserves, and, in the words of Gen. C. C. Andrews, the veteran forest commissioner of Minnesota (who failed to secure but a part of the appropriation he urged as necessary to the protection of his state shortly before the great fire): "The best way to put out fires is to prevent them."



THE LAKE STATES FIRE CONFERENCE

A Working Meeting that Accomplished Results.

AN ASSEMBLY of national and state forest officers and other officials, railroad, insurance, and lumbermen, from the three great lake states—Minnesota, Wisconsin, and Michigan—made up the conference in Saint Paul December 6th and 7th, for the discussion of the causes and prevention of forest fires in the three states. These men were vitally interested, paid the closest attention, and remained through every session to the end. The work of the conference had been thoroughly considered and planned beforehand, especially in Minnesota and Wisconsin, and the gentlemen who attended were fully prepared to go right to the heart of the subject. These facts establish the significance of the meeting.

Governor Eberhart of Minnesota, who took a deep interest in the conference, was especially pleased at the outcome and will make recommendations to the legislature based upon the resolutions. The principal result of the conference, however, is looked for in the effect upon public sentiment.

The conference was arranged by the Minnesota State Forestry Board and the Minnesota Forestry Association. It was in the minds of the promoters and of all those who took an active part in the proceedings that the time has gone by for generalizations, that the broad principles of forest conservation are admitted, and that it is full time to get down to working details and actual results. Fire prevention stands at the head of the list of essentials and the deplorable losses of the past season have placed striking emphasis upon its importance. Here, then, was a point of approach in which foresters, timber-land owners, railroad men, insurance men, and indeed the whole body of citizens were directly interested and their interests were at one.

The recommendations embodied in the resolutions are summed up in a demand for non-partisan forestry commissions in each state, with as full powers as are permissible under the state constitutions. Wisconsin already has a good foundation for this organization, its present board and forester only needing enlarged powers and appropriations. Minnesota is not so well and consistently organized, but the vast state property involved (Minnesota still has three million acres of state lands), and the consequent wealth of the state, which enjoys freedom from state taxes, make it probable that the state's lawmakers will work out the reorganization successfully. The prospects in Michigan are not so easily estimated, as the state's attitude and public sentiment are not so well defined. Leading railroad and lumbermen who were present at the conference expressed the opinion that the railroad and lumber interests would not oppose but would support the carrying out of the recommendations.

There were several valuable papers read at the conference, all of them sharing the business-like character of the general proceedings.

The paper by General C. C. Andrews, forestry commissioner of Minnesota, we print in full. A paper by Henry S. Graves, chief forester of the United States, on "What the Forest Service Does to Prevent Fires," was read by William L. Hall, assistant forester of the United States Forest Service. The

ground has been quite fully covered in articles by Mr. Graves in recent numbers of *AMERICAN FORESTRY*. C. R. Pettis, superintendent of state forests of New York, gave an address on "How New York Prevents Forest Fires." A paper by Edward T. Allen, forester of the Western Forestry and Conservation Association, was read by J. E. Rhodes. The substance of this paper will be contained in an article on the work of his association which Mr. Allen is preparing for this magazine. In a supplementary letter read by Mr. Rhodes, Mr. Allen made these definite recommendations for the essentials of an effective state policy:

1. A state board of forestry selected with the single view of securing the most competent expert judgment on the matters with which it deals. Elective or otherwise political representations should be eliminated, with the single exception of the governor himself, and the latter should be restricted in his appointments to the representatives of the agencies most familiar with forest management, like forest schools, lumbermen's associations, forest fire associations, conservation associations and the federal Forest Service, etc.

2. A trained state forester, wholly independent of politics, chosen by the board largely for his demonstrated ability in executive and practical work. Here is one place not to economize, but to get the best available, for upon him depend the successful development and execution of a rational, far-seeing policy, the organization of fire work, the tactful enforcement of law, and the effectiveness of the educational campaign. He should have one or more assistants of his own appointing.

3. Adequate funds and authority in the state forester's hands to get the assistance necessary to enforce the fire laws, apprehend violators, and secure evidence for their conviction, where local means of doing this is not effective. The property owner can not act in this successfully and local county officials often fail to give the subject proper interest.

4. Funds and organization enabling the state to patrol and fight fire, where these steps are necessary to protect life and property, but where the interest of forest owners or the intelligence of local authorities are insufficient to provide any such protection. Local effort should be sought to the greatest possible extent, but where it does not exist the state's responsibility to protect its citizens from distress is all the greater.

5. Funds and organizations with which the state can encourage and cooperate with local effort, whether by counties, towns or forest owners' associations. Seldom, if ever, can these afford to bear the entire burden of a system as effective as public welfare demands. Nor is it fair that they should, for the entire state participates in the benefit. Nor will the public at large ever take the proper interest in fire prevention, in good laws, and in good officers, until it has a financial stake in the system.

6. Clear, detailed and comprehensive fire laws, bearing rigidly and justly upon all classes alike, whether railroad, lumberman, camper or settler, but flexible in application to differing localities and seasons. Since enforcement, rather than to secure penalty for violation, is their object, the penalties should not be so heavy as to deter conviction, but the prohibitions should be strict. There should be penalty for neglect by any proper officer or magistrate to enforce them.

7. Application of forestry principles to the management of all state-owned forest lands and ample funds for the purchase of land suited better for state than for private forestry. Until the state shows confidence in forestry, individuals can not be expected to.

8. Encouragement of private reforestation by assessing deforested land annually on land value only, unenhanced by reason of any growth thereon, and deferring taxation of the crop until it furnishes revenue with which to pay the tax.

9. Systematic study of forest conditions and management, to afford basis of intelligent administration, further legislation, and the public and private practice of forestry.

10. Sustained systematic publicity and educational work, with specific advice to those who desire to improve their methods. When everyone understands the importance of forest preservation it will be secured without trouble; and the state is the proper exponent.

11. Close and constant conference with properly accredited representatives of private forest industry. Business and technical considerations are involved if the state activity is more than a name. Independent action will fail to get the best results even if it does not invite actual friction.

12. Through the study of this subject of taxing the mature timber, to the end of adopting a system which, by insuring fair revenue without enforcing bad forest management, will result in general community good.

Marcus Schaaf, state forester of Michigan, discussed the forest laws of that state, and Edward M. Griffith, state forester of Wisconsin, discussed conditions in that state.

At the Wednesday sessions C. V. R. Townsend of Negaunee, Michigan, described the protective methods of the Cleveland-Cliffs Iron Company. R. H. Aishton, vice-president of the Northwestern Railway, spoke on "The Interests of the Railroads in Protecting the Forests." This address appears on another page. The next speaker was Thornton A. Green of Ontonagon, Michigan, president of the recently organized Northern Forest Protective Association, whose address on "The Interest of the Lumberman in Practical Forest Legislation," we also print on other pages.

The closing session was given to a general discussion, and Wednesday evening the members of the conference were entertained by the Commercial Club of Saint Paul at a banquet at the Saint Paul Hotel.

A noteworthy feature of the conference was the fact that notwithstanding the varied interests that were represented, the resolutions received unanimous and hearty approval, a fact which promises well for putting them into effect. The committee was made up of T. A. Green, J. C. Knox, Thomas B. Wyman, R. M. Aishton, and F. E. Michelson, representing Michigan; E. M. Griffith, J. F. De Vor, W. H. Bissell, W. A. Holt, and William Bray, representing Wisconsin; W. A. McGonagle, J. C. Matchitt, H. Oldenberg, A. F. Woods, H. R. Mackenzie, and E. G. Cheyney, representing Minnesota.

THE RESOLUTIONS.

Resolved, That we recommend to the legislatures of our states:

First, that the forest fire protection of each state and such other branches of state work as may be deemed best to combine with it, be placed under the control of a non-partisan commission empowered, as fully as possible under the constitution of the different states, to carry on the work, and under civil service rules. Such commission should represent all the interests involved as far as possible, and we recommend that such commission place the work in charge of a chief forester who should be a professional graduate forester and that the commission employ such trained foresters and other assistants as may be necessary; define their duties and fix their salaries; said employees to be engaged under such civil service regulations as the commission may prescribe.

Second, that it is the sense of this conference that the present forest fire warden service of Michigan, Wisconsin and Minnesota is totally inadequate to meet the existing fire hazard to both life and property, and that forest protection service, to become efficient, must be greatly extended. To this end we recommend an adequate forest patrol system, maintained by the state, organized and operated by the commission referred to.

Third, that the commission be authorized to cooperate with the national government, the several adjoining states and such associations and organizations as the commission may find necessary to best protect the timber resources of the state.

Fourth, that this conference is opposed to a general slash burning law, as experience has proven it unsatisfactory, impracticable and dangerous. We recommend, however, that the commission shall be given authority to order the disposal of dangerous slashings sufficient to establish a safe fire line around standing timber or other valuable property.

Fifth, that this conference advocates legislation providing strict regulation of the burning of brush and debris in clearing land during the dry season, such burning to be under the direction of state fire patrolmen, under such regulations as the commission may prescribe.

Sixth, that the burning of all debris on the rights of way of the various railroads be under the control and direction of the state forest patrol. Further, that under special conditions as directed by the state forest patrol the railway companies maintain a patrol, properly equipped following their trains, also that all railroad and logging locomotives and traction engines must be equipped with the most practical spark arresting devices (subject to inspection and approval of the commission).

Seventh, whereas the building of fire lines around exposed property, including settlements, villages and towns has proved a most effective means for the control and extinguishment of fires, we recommend that one of the principal duties of the patrolmen, working under the direction of the commission, should be to establish such fire lines where necessary for protection of property.

Eighth, we recommend as the most effective measures for preventing and fighting serious fires, adequate means of transportation and communication, to include trails, telephone lines and lookout stations, and that the efforts of the commission should be exerted toward the construction and establishment of the same as rapidly as consistent.

Ninth, the appalling sacrifice of life and the continued great loss of state and private property resulting from fires in our forested area, are a disgrace to our civilization and a most serious drain upon our natural resources, and we believe that the expenditure of such amount as may be necessary to prevent these losses is fully justified.

We therefore recommend that the appropriations by the state legislatures to maintain forest protection should be sufficient to provide for a forest patrolman for each forty thousand acres requiring protection as well as for the expenses necessary to successfully carry out all of the measures suggested by these resolutions.

We recommend in addition to the patrol system an auxiliary county fire fighting force to be appointed by and under the direction of the commissioner, to be paid by the state and charged back to the county. Such expense ultimately to be borne by the counties or towns in which the fires occur.

Resolved, That as it is shown by statistics that there are a large number of fires set each season through the carelessness of the general public, including campers, fishermen, hunters and others, we recommend that a campaign of education be carried on energetically through every possible channel to the end that this hazard be reduced through a better understanding of forest conditions by all the people.

Resolved, That the sincere thanks of all the delegates and attendants here be extended to the officials of the state of Minnesota and the city of St. Paul, who have contributed so largely to the success of this conference, to the Manufacturers' & Jobbers' Association of St. Paul for the courtesies shown; to the management of the St. Paul hotel for the facilities so freely extended, and to the press for its treatment of the proceedings of this Lake States Forest Fire Conference.

LUMBERMEN AND FOREST LEGISLATION

By THORNTON A. GREEN,

PRESIDENT OF THE NORTHERN FOREST PROTECTIVE ASSOCIATION.

(An address delivered at the Lake States Conference, St. Paul, December 6.)

THE lumbermen of Minnesota, Wisconsin and Michigan do not seem to have paid a great deal of attention to forest legislation in the past, except to oppose a few laws that seemed about to lay an unnecessary burden upon them. Until very recently the legislatures of these states had enacted few practical laws. The lumbermen now are fully awake to the necessity for some action that will give better protection to their timber lands. Changes in the statutes are likely to be made in all three states this coming winter and the lumbermen are most vitally interested in any changes that may be made.

The lumbermen's chief asset is standing timber. Mills, railroads and equipment are practically valueless if there are no timber resources behind them.

There is a marked increase in the amount of timber offered for sale by the non-operating timber owners as well as by the operators. The prices that have prevailed for several years are being shaded in consequence. Forest fires have had much to do with this weakening of timber values.

Many lumbermen must, of necessity, resort to bond issues in these times of high values of stumpage and high cost of labor and supplies, coupled with the low price of lumber at the point of production. Standing timber is the principal security for these bonds. It is only by exercising great care in the protection of our timber resources that timber bonds can be kept at par.

Insurance upon the plants and output of the lumber companies always has been comparatively high. Unless something is done to lessen the risk from forest fire exposure many lumbermen and lumber towns will find it difficult to obtain adequate insurance at reasonable prices.

When the modern lumberman builds his mills and railroads he estimates the probable life of his plant by the amount of timber he has. Any loss of timber follows through every step of his operations. In many cases the added expense of producing logs from burned timber is more than the actual loss of stumpage.

When forest fires are extensive there is an over-production of lumber because of the cutting of burned timber to save it. Over-production always means low prices.

There is one loss in timber that is greatly exaggerated by forest fires. The decay following fires causes a large increase of the insect enemies of growing timber. In the northern peninsula of Michigan bark beetles and borers attacked the burned hemlock and pine immediately after the great fires of last July.

In the future we may look for a more rapid decay of every imperfect tree growing near the burned districts. Great numbers of trees not burned will die from the attacks of insects as the indirect result of the fires. For many years the owners of mixed hardwood and hemlock timber lands thought themselves almost immune from fire loss. The leaf fires of October and November, 1908, were new to many owners. That year and the next it was thought little damage had been done. The contrary is now known to be true. A considerable part of the burned districts are dead or dying. This last summer we saw large areas of mixed timber, containing very little pine, burned so badly that the trees were all killed immediately. Hardwood trees burned like conifers.

We have figured in the past on getting the bark from the burned hemlock trees. This year they were burned so badly that the bark already is decayed and has been fairly riddled by woodpeckers and sapsuckers in search of the swarms of bark beetles that have infested the trees. Where the timber was burned last summer very little bark will be gathered next season.

A brief description of how a lumberman makes money from our forests may not be without interest.

Assume that he has paid \$15,000 for a group of timber and upon cutting it and after paying all the bills and selling his lumber he has \$17,000. In other words, he has made two thousand dollars. Then he finds he needs more timber. He tries to replace the acreage he has cut and is compelled to pay \$17,000 for it, just what he took out of the first tract. This performance is repeated year after year in the hope that future manufacturing profits may be larger. He rarely makes a dollar sawing lumber and often loses. If he manages to wind up his operation with about as much timber as he started with, he makes money because of the natural increase in timber values. If some of the timber land left has been burned over, the operation likely will show a loss and not a gain. The lumber business is largely one of book profits today. Cash dividends do not come with regularity.

These are some of the reasons why the lumbermen are interested in laws for the protection of forests, but I do not mean to imply that they alone are interested. The entire country is aroused to the necessity for action. It has been difficult in the past to convince the residents of the unforested parts of the lake states that they have a common interest with the lumbermen in the protection of the forests. They are beginning to understand that the lumbermen are less interested in protecting the remaining forests than they are. The owners have an average value in their stumpage of about \$2.50 a thousand and they disburse, in the process of reducing the tree to a marketable product, about four times that amount.

The public, realizing at last that the wanton destruction of the forests means a distinct loss to everyone, demands that something be done; and something will be done. Such vast resources have been destroyed by fire in recent

years, coupled with a heavy loss of life, that the people will not be denied. There is only one way open to them—the law. New laws and amendments to existing laws are proposed on every hand. Some of them single out the lumberman as the scapegoat, a few place the burden upon the railroads. The records of Forester Griffith, of Wisconsin, show that 60 per cent of all the fires in the five years preceding 1910 were set by homesteaders, 15 per cent by railroads, and 25 per cent by campers, careless hunters and others, including the lumbermen. It seems probable that the number of fires for which the lumber companies are directly responsible are not many. Few people respect the forests as they should. Some abuse the railroads for setting fires and then throw lighted cigars and cigarettes from car windows in dry seasons. There is altogether too much carelessness. Fire is a terrible scourge. It is not to be played with.

The experience and training of average lumbermen should enable them to be the best judges of what is practical legislation for the protection of forests from fire, while the people in general are not well informed on these matters.

Few outside the lumbermen and forests understand the difficulty of enacting laws that really will help the situation. Many laws that have been passed in the various states in recent years have made matters worse instead of better. Some laws actually have set a premium on setting fires by providing such high daily wages for fire fighting that fires were set to get the money. New York was compelled to change her laws to stop that practice. Several other states will soon follow her lead.

The so-called self-dumping-ashpan law, passed by our national Congress a few years ago, has proved to be a source of many railroad fires.

The Minnesota law passed at the last session of the legislature that provided for the burning of the slashings left by the lumbermen has proved to be impractical, in fact, very dangerous. An attempt to burn slashings by a large operator during the last season resulted in the burning of 200,000,000 feet of white pine.

Men have said in public that the lumbermen should not be allowed to make any slashings. While such a demand is ridiculous it is no more so than a general slash-burning law would be. Advocates of such a law surely do not realize what they propose to make the lumbermen do. They have not stopped to think that very few people own solid blocks of timber, that there may be neighbors who are completely surrounded by slashings. The days when slashings of that kind, in most timber, could be fired without damage to the adjoining stumpage would be few and far between. In fact, at no time during the summer months is it safe to set large fires, for when once started they creep into the roots and moss and smolder for weeks, so that a high wind may fan them to a blaze at any time. These ground fires have been known to last from midsummer until snowfall, and even through the winter. Some will suggest waiting until winter to burn cutover land. The early part of the winter finds the fuel too wet and later the snow is too deep, in many parts of the lake states. In mixed timber there are many small trees and defective mature trees left after logging. In a few localities the immature trees may become valuable timber stands if allowed to grow. Nearly all the timber remaining is valuable for wood and is the chief source of the settlers' income during the first few years they occupy their farms. My own personal experience leads me to believe that this valuable remainder cannot be saved where slashings are burned.

In the hemlock forests the bark must be peeled in June, July and August, and often a year's supply of logs is cut then. Long before winter comes those slashings are as dry and dangerous as any. Where the hemlock and hardwood timber stands thick upon the ground a great deal of small timber will

be killed by the heat when the land is burned over. Even where great care is exercised such will be the result. In a very large number of cases there is more fuel for fires a second year than there was at the first burning. This is not true of solid pine stands, but Michigan and Wisconsin have very little of that kind of timber left.

The burning of slashings in most cases only relieves the situation temporarily, for no one fire will take the stumps and old wet logs, which when well rotted burn like tinder, and these, together with the brakes, wintergreens and other vegetation that naturally springs up in all burned districts, find a fire as quickly and as surely as the original slashing. Many remedies considered impractical might be of value if the average labor that can be found for the work could be relied upon to use judgment and care. That class of labor seems to have almost disappeared from the earth. The cost of burning the slashings must not be lost sight of because any added expense will prove ruinous to a large number of lumber manufacturers at this time.

The price of lumber at the mills is very low and admits of no profit to the producer. Hemlock lumber at the saw mill is now worth just about what it was ten years ago, and there was very little profit in it then. Our mixed timber forests of Wisconsin and Michigan contain 50 to 80 per cent hemlock. The present stumpage cost is three times what it was then, and the manufacturing costs have increased considerably.

Without question, the only cheap way to burn slashings, in general, is to set fire to large areas and allow the fire to run before the wind. Anyone making a practice of burning that way hardly will be regarded as a good neighbor. If slashings are to be burned, they must be burned with great care. In heavy, mixed timber the cost will then be prohibitive. But we all will admit that something must be done and at once. In the first place, the timber owners must help themselves, after that they may expect some help from others.

By concerted action the lumbermen can show the country that they are taking an intelligent interest in the protection of our forests. Unless they combine their efforts to prevent it they may expect much impractical legislation in the next few years. There must be a campaign of education to spread the truth. The public still needs educating.

A little over five years ago I organized the Michigan Forestry Association, and, outside of a very few, I could find no one who understood what I was talking about when I discussed problems such as we are discussing here. Today everyone knows something about these matters and nearly everyone takes a lively interest in them. Five years more with a proper educational campaign and the average citizen will be able to solve some of the difficult problems we must meet in trying to save our remaining forests from devastation by fire.

There is no better way to prove that the timber owners mean to do their share in this matter than by active organizations, the object of which shall be to prevent forest fires as far as it is possible to do so. The timber owners of the Pacific Northwest are banded together in a dozen or more associations whose object is the prevention of forest fires. They are trying to educate the rest of the people to help them by being more careful. Their rangers fight the fires that do start, and they have been very successful. During the last season when Washington, Oregon, Idaho and Montana were swept by a perfect hurricane of fire, comparatively little damage was done on the timber lands patrolled by them. Many fires started but few of them gained headway enough to cause extensive loss. The rangers of one association put out about 1,200 fires last season.

I recently organized the Northern Forest Protective Association along the lines of the western associations. It started out with a membership represent-

ing 2,000,000 acres in the upper peninsula of Michigan and it is expected that there will be 4,000,000 acres in the association within six months. The organization is broad enough to take in all of Wisconsin and Michigan.

A thorough private patrol backed by a law like that proposed for Wisconsin, under which the state would provide a regular patrolman for every 40,000 acres or less of forest land, will go a long way toward eliminating fires. The only laws that will be of any avail will be those that will help the state, and private owners do that work.

Some say that the lumbermen never have stood their share of the taxes. I will venture to say that no other business ever received less return for taxes paid than the lumbermen of the north central states. They have had little or no police protection; hunters and fishermen roam their lands at will and set fires when and where they please. They have had few roads, and no public improvements worth mentioning.

There should be no rigid laws providing that certain things must be done regardless of locality. The conditions often are very different in adjoining geographical townships. What is feasible in one county may prove otherwise in the next. It would seem as though able commissions, as far as possible non-political, clothed with the necessary authority could best handle this matter. Nothing must be done that will be such a burden upon the lumbermen that they will have any harder time meeting the ruinous competition of the manufacturers of yellow pine in the South. No benefit would accrue to the citizens of these lake states in that way. On the other hand, nothing must be done to stop the development of the farms that follow in the wake of the logger. How important this is may be seen in the fact that upper Michigan buys 95 per cent of what she eats. This great importation is due to the lack of developed farms, not because she can not grow more of her food supplies.

Experience has taught the forester that the best way to prevent fires from spreading is by clearing out paths or fire lines. It is possible that the clearing up of a strip of land a few rods wide between the slashings and the timber may help to keep fires within small areas. If that plan was adopted and the lumbermen were compelled to cut the tall dead timber of any variety for a certain distance back from the fire lines, at the same time they cut the sound trees, and a good system of patrol was put in force, I feel quite certain that large fires would be a thing of the past. The cleared lanes around slashings would make access to fires much easier than it is today. Fires are more easily prevented than stopped. If they do start get to them as soon as possible and put them out when they are small.

The meat of the nut is an active campaign on the part of every one to prevent fires and quick action if they start. In this matter an ounce of prevention is worth a pound of cure. The fuel is always on hand and always will be. No law can prevent its accumulation. It is necessary.

Nature takes care of this accumulation by decay, adding humus to the soil that will be needed by the farmer of tomorrow in his effort to feed the ever-increasing population. Very soon the clearing of land from which the timber has been cut will be entirely a problem for the homesteader or pioneer farmer, and not for the lumberman to solve. Cut-over lands suited for agriculture will not lie idle long in the future.

Let us make haste slowly. The only laws that can be of lasting value to us will be those the enforcement of which will not be hindered by politics. Laws passed on the impulse of the moment, urged by those with little or no practical knowledge of conditions, will be poor laws. In the opinion of many we have too many laws of that kind now. I can see no remedy for this unless gatherings similar to this one, at which all interested parties confer, are to become ever a more important part of our commercial and political life.

RAILWAYS AND FOREST PROTECTION

By R. H. AISHTON,

VICE-PRESIDENT OF THE CHICAGO & NORTHWESTERN RAILWAY.

(An address delivered at the Lake States Conference, St. Paul, December 6.)

I HAVE been asked to prepare a paper on the interests of the railways in protecting forests. First, let us consider what are the interests of the railways in these three states represented in the conference, and through which these railways pass. In Minnesota there are, approximately, 33,400,000 acres of forest area; in Wisconsin, approximately, 20,300,000 acres of forest area, and in Michigan, approximately, 24,300,000, making a total in the three great states of 78,000,000 acres of forest that we are here to try to protect.

In Minnesota, located within the forest area alone, there are 2,000 miles of railway; in Wisconsin there are 2,300 miles, and in Michigan there are 3,200 miles, or in the three great states 7,500 miles, lying wholly within the forest area, and this does not include logging roads, double tracks, sidings, spurs or anything but main tracks.

In the operation of these railways, and used exclusively within this forested area, there are, in the state of Minnesota, in regular service, 350 locomotives; in Wisconsin, 450, and in Michigan, 530, or an approximate total of 1,330, employed regularly, and this does not take into account extra locomotives required for relief, shopping, or to meet emergencies or exigencies in business; and it is safe to say that to perform the service in the forested area in these states there are employed each year—at some period of the year or other—approximately 1,800 locomotives.

The magnitude of the traffic through these districts can probably be best indicated by the statements that in the forest area of Minnesota there are moving daily 126 passenger trains; in Wisconsin, 240, and in Michigan, 230, or a total of 596 passenger trains daily moving through some part or other of this forest area.

There are also operated daily through this forest area, in Minnesota, 250 freight trains; in Wisconsin, 340, and in Michigan, 350, or a total of 940 freight trains daily, all of which move through this forest district.

It is hardly necessary for me to call your attention to the fact that the railways are, and will be for years to come, the greatest single consumers of the products of this timber country, and furnish a ready market for the settlers, lumbermen, and for other interests, and they realize fully, I think, the benefits accruing to them through conservation of the remaining forest areas in these states lying right at their doors, and they also realize fully that for every dollar they pay for piling, posts, lumber or ties throughout this district a certain portion of it comes back to them necessarily through the cleaning up and cultivation of the country; the bringing in of an additional number of people who are capable of earning a livelihood, and for whom they must transport the necessities of life, and to whom they must look for their support.

From another standpoint: Minnesota, northern Wisconsin and Michigan forest country is today the most attractive fishing, hunting and summer resort territory left in this great country of ours and is tributary to the greatest centers of population in the country with the single exception of the Atlantic

seaboard. The railways, more than anybody else, appreciate the possibilities of the proper conservation, care and development of these areas, and that where they now carry people by the hundreds to these resorts they will soon be carrying them by the thousands with resulting benefit both to themselves and to the communities residing within these districts.

We have heard a great deal lately about the cost of living. With the wiping out of the tie, post and lumber supply through this northern lumber country, the effect on the maintenance cost to the railways, about which we have heard so much in the rate hearings lately, would be particularly disastrous.

We all remember the day when the northern limit of agriculture was about at Green Bay, Wis. Today we find, bordering the lakes, successful agriculture carried on right up to and beyond Lake Superior, and where formerly the forest held sway we find today prosperous and contented settlers improving the land, raising crops and sustaining not only themselves but the large communities incident to that territory. Had this territory been deforested through fires, the ability to get settlers to go in there would have been limited as, in a great many cases, even the soil itself is destroyed or rendered unfertile through fires passing over it, and the ability therefore to develop agriculturally is gone.

The question now occurs, what, with all their varied interests in the prevention of forest fires, have the railways done to prevent them? I know what the general practice has been.

First. Maintenance of a clean right of way, free from brush, stumps and rubbish.

Second. Co-operation with the fire wardens in keeping the right of way thoroughly cleaned up and burned off.

Third. Absolutely prohibiting the setting of fires by section men, or other employees, except during the winter months or under the direction or order of the fire warden.

Fourth. Installation of the very best and most approved netting in the front ends of locomotives, and constant investigation and experimenting into every new appliance that promises any relief from fire. In connection with this a very thorough system of inspection at terminals and record of the condition of netting, and arrangements for repairs of same when defective.

Fifth. During particularly dry periods the abandonment of freight service during daylight hours.

Sixth. When dry conditions prevail the establishment of patrol either behind trains moving through the district, or at points in close proximity to each other, to guard against fires starting on the right of way and all times maintaining section patrols.

Seventh. By instructing train crews and engine crews on the importance of avoiding every possibility of setting fires, and directing them when fire is found on the right of way, to stop their trains wherever practical and put it out. Or in cases where their own, or any other train, would be endangered by such steps, by leaving word with the first agent or section crew and having them start back all the help possible to put out the fire.

What further can the railways do? I am very frank to say that I do not know.

They believe that the protection of the forests now conserves the revenues of the railways in the future, and to many of the railways it means their future life and prosperity.

They believe that the protection of the forests may be bettered by more efficient control by the officers of the states over all the interests engaged in business in the timber areas.

They believe in taxation that will enable a well trained and efficient force to be organized and maintained in each state, and endowed with police powers for the protection of the forests.

They believe the interests are so great and so identical that settlers, lumbermen, manufacturers and railways, and every other interest should unite in a plan to which all can work, which would be harmful to no interest but beneficial to all.

THE LOST TRAIL

While the drizzle falls on the slimy pavement, swelling
The yellow gutters' flow,
And the ways are dense with the hosts of buying, selling,
And hurrying to and fro,
I know that out in the north the winds are crying
Round the willowed shores of the long white lakes outlying,
And the black pine woods where my old lost friends are dwelling,
And the splendor of the snow.

I know that mysterious land of wood and river
Where the half-breed hunters range,
The snow wraiths dancing upon the hill slopes ever,
The gray sun, low and strange,
The bull moose skulking through windrow and through hollow,
The creak and crunch of raquettes where the trackers follow,
The dark spruce shades where the forest dreams forever,
But never dreams of change.

A snowshoe track leads up from the swamp and over,
Where the otter trappers passed,
To the drifted winter hut in the hemlock cover
That shields it from the blast;
Are you there, Pierre, Gaultier, as when we together,
Free in the face of the grim Canadian weather,
Learned the changeless spell of the north to hold and love her,
And to turn to her at the last?

The snowstorm blindly drives through the woods to smother
The ancient trail I knew;
The track we blazed is lost, and never other
Has marked that blind way through;
But the same great roar through the leagues of branches sweeping
Wakes the desire of a homesick heart that has long been sleeping;
Oh, dark north woods, wild love and ruthless mother,
I call, I cry to you!

F. L. Pollock in the Atlantic, May, 1901.

THE PROTECTION OF FORESTS FROM FIRE

By HENRY S. GRAVES

FORESTER, UNITED STATES DEPARTMENT OF AGRICULTURE

Part V—Concluded from December Number

METHODS OF FIGHTING FIRES

THE principles of fighting forest fires are essentially the same as those recognized in fighting fires in cities. The following are of first importance: (1) Quick arrival at the fire; (2) an adequate force; (3) proper equipment; (4) a thorough organization of the fighting crew, and (5) skill in attacking and fighting fires.

Quick Access to Fires.

Quick access to fires is accomplished through the work of supervision and patrol in discovering fires before they have gained much headway, and by a well-developed system of communication through the forest by roads and trails.

An Adequate Force of Fighters.

A small fire may be put out by one man, but in extensive forests several hours may pass before the fire can be reached. It is important to secure an adequate force of men and to get them to the fire quickly. In a well-organized system of patrol the guard who discovers a fire communicates quickly to other guards and to headquarters by telephone, signal, or other means, and indicates the number of men he needs. It is essential that there be definite arrangements for securing a force of men in case of fire. This may be accomplished by co-operation with lumber or sawmill operators who employ forces of men, and through co-operation with local residents, or, in case of small tracts, through the co-operation of neighboring owners, each of whom agrees to assist his neighbor in case of fires. In some states there is a system of fire wardens. In case of fire, the fire warden may call upon residents to assist in extinguishing it. They are required by law to repair to the fire in case of call, and there is a small statutory compensation for services. In case of extensive forests co-operative arrangements should be made with every resident within the forest and with every user of the forest to assist in fighting fires. In most cases where lumbering is going on the men who are employed in the logging operations, at sawmills, in road construction, etc., will furnish a large force on occasion. Through an efficient system of co-operation it is possible to secure quickly a large force of fighters, and through this same system all the residents soon take an active interest in preventing fires from starting.

The co-operative fire protective associations in the Northwest, following the example of the Forest Service, have organized systems of patrol and are doing highly important work in suppressing forest fires in the white-pine regions of Idaho and Montana and the fir forests of Washington. These associations now include practically all of the large timber owners in the Northwest, and many small owners as well. The expense of maintaining a patrol during the dry season, of fighting fires, and of building trails and telephone lines to

assist in fire fighting is apportioned among the members of the association on an acreage basis.

Proper Equipment for Fighting Fires.

Just as in a city the efficiency of a fire service depends in large part on the equipment, so also in forest work it is essential that fire fighters be furnished with the proper tools and other equipment. The implements needed for fighting fires differ under different conditions. Wherever dirt can be used the men should be provided with long-handled shovels. If water is available, buckets should be provided, and, where possible, bucket pumps. Under most conditions it is desirable to have mattocks and iron rakes, and there should always be axes to aid in clearing brush or cutting through down timber and old tops.

These implements should be kept in a convenient place for use in fighting fires. Proper organization for fire protection includes an adequate equipment for the fire-fighting force. No matter how numerous or skilled the crew, the men are helpless without proper implements. In the protection of woodlots in settled regions every farmer who repairs to a fire usually takes his own shovel, rake, ax, or other implement. In the more remote forests under organized protection, the implements are usually provided by the ranger. A very good plan is to have caches at convenient points on the trails or at the lookout stations, containing fire-fighting tools. In some cases in the mountain regions tools are kept in a special pack outfit ready to be thrown upon horses and taken at once to the fire. Such special outfits usually include shovels, collapsible pails, axes, mattocks, ropes, and in some cases fire extinguishers, and a small quantity of provisions to enable fire fighters to camp out over night if necessary. Where there are good roads, as in the woodlot regions, special fire wagons have been used to advantage. (Pl. X, fig. 1.) These consist of an ordinary wagon of the Concord type, furnished with a complete equipment of tools, bucket pumps, fire extinguishers, water tanks or barrels, etc. The author has used on his own tract in Pennsylvania a crude fire wagon consisting of a two-seated buckboard provided with a special galvanized-iron water tank with a capacity of about 1½ barrels. The wagon is also equipped with two fire extinguishers, two bucket pumps, one-half dozen buckets, shovels, rakes, axes, and such other tools as are needed in fighting fires.

Organization of the Fighting Crew.

It is important that there be in charge of the fighting crew someone in authority to thoroughly organize the work. A small crew well organized can do much more effective work than a loosely organized large crew. One of the advantages of the fire-warden system adopted in a number of states is that the warden has authority not only to impress men to fight fire but to direct their work.

The efficiency of the fire-fighting crew depends very largely on their skill and experience, and particularly on the skill and experience of the man directing the work. It is not only a question of knowledge of how to assign each man where his work will be most effective, but there must be judgment exercised in determining the general method of attack. The character of the fire, the character of the forest, the condition of the atmosphere, the strength and direction of the wind, the rapidity with which the fire is running, and many other points have to be taken into consideration.

Methods of Fighting Surface Fires.

Small surface fires may often be beaten out. This is possible when the fire is burning chiefly in a dry leaf litter or short grass. Where there are tops



Plate X, Fig. 1

A FIRE WAGON



Plate X, Fig. 2

METHOD OF BEATING OUT A FIRE WITH THE AID OF WATER

or piles of dry brush, or the fire is burning through thick brush or undergrowth, beating is very difficult.

There are various devices for beating. A blanket, coat, or riding slicker is often used. A gunny sack is one of the best implements for beating, particularly if it can be wet from time to time. A handful of green brush serves also very well for a beating device. In beating out a fire, one strikes the fire with a sideways sweep, driving the flames and burning material back upon the burned ground. A direct stroke scatters the fire. (Pl. X, fig. 2.)

The best way to extinguish running surface fires is to throw sand upon the flames. This method is, of course, practicable only when the soil is fairly clear of rocks and loose enough for ready digging. In the plains of the Atlantic Coast, for example, the sand is so loose that it can be dug up and thrown on a fire almost anywhere. The fighting crews are equipped with long-handled shovels, and the sand is thrown along the line of fire. When the fire is running in the open woods, in pine needles, a single shovelful of sand, properly thrown, will extinguish over 10 feet of fire.

Loose loam is also very good, but not so effective as sand. Heavy soil which clods is difficult to manipulate. Frequently sand or loose loam can be dug up in spots, but it is too stony to secure it all along the line of fire. The fighters must then supplement the use of sand or earth with beating or other methods.

Where, on account of the accumulated débris, the flames are intermittently too severe for beating, water is used if available. Water usually has to be brought from some distance; it must therefore be used very economically. The best way is to deaden the flames by a little water, and then beat them out with a gunny sack or other device. Experience has shown that water may be most effectively applied by a hand spray pump. This pump throws a stream 20 or 30 feet and makes it possible to apply the water exactly where it is most needed. The pump can be purchased at prices varying from \$3 to \$4.50. They are extensively used by farmers in the Northeast. Collapsible pails are excellent for carrying water, because of their lightness and compactness. Ordinary metal water pails are commonly used by farmers, and are much cheaper than collapsible pails.

When water must be brought over mountain trails special water sacks are used, which can be slung on a pack saddle. Water kegs adapted to pack horses have been tried in Pennsylvania. Where there are passable roads water is hauled in barrels or in specially constructed tanks.

Patent fire extinguishers have also been used in fighting fires. These throw a stream of water from 15 to 20 feet. The stream is chemically charged, so that it is very effective in putting out flames which would be little affected by ordinary water. In practice a crew is provided with several extinguishers, a supply of water, and extra chemical charges. As soon as an extinguisher is emptied it is reloaded, so that there may be a continuous play along the line of fire. In case of an ordinary fire running through grass or leaf litter, one extinguisher will put out 200 feet of flame.

A very good method in fighting running surface fires, where there is not much slash, is to make a narrow trace in front of the fire by raking to one side the leaves and other litter. As soon as the fire reaches the trace it is checked and readily beaten out. Sometimes, on level land and in open woods, a furrow is plowed as an emergency fire line. (Pl. VII, fig. 2.) This same principle is used to check fires burning through young growth and brush where it is difficult to get at the flames. A narrow lane is cut through the brush ahead of the fire. This gives a space where the crew can work without hindrance. As soon as the fire approaches, it is attacked by all the crew with the various fighting devices with which they may be provided.

Sometimes the front of the fire is so fierce that it is impossible to meet it directly. One method under such circumstances is to direct the course of the fire. The attack is made on the sides near the front, separating the forward portion of the fire from the main wings. A part of the crew attacks the forward part and others run down and extinguish the wings. The front of the fire, attacked from the sides, is forced gradually and constantly into a narrower path. Usually the front can be directed toward some cleared space, road, pond, stream, swamp, or fire line, when it will be checked enough to admit of a direct front attack. Sometimes by this plan the front may be rapidly narrowed by working from the sides, until it is at last entirely extinguished. The plan of giving direction to the course of the fire has often been successfully carried out when the fighting crew is too small for a direct attack.

Methods of Fighting Ground Fires.

Ground fires, burning in the deep layer of organic matter, are exceedingly difficult to extinguish. If the layer of vegetable matter is not very deep, it is sometimes possible to put out the flames by water or sand. If the layer is deep, trenching is the only practical method of stopping the progress of the fire. In using this method of fighting ground fires, one judges the rapidity with which the fire is burning and then, at a proper distance away, digs a trench through the vegetable layer down to the mineral soil, using axes, mattocks, and shovels, as the particular case may require. Such a trench, which has a width at the bottom of one foot, will enable the fighters to stop an ordinary ground fire, especially if the work can be supplemented by the use of water or sand at the trench.

Methods of Fighting Crown Fires.

Crown fires are always accompanied by surface fires. Crown fires stop when there are no longer inflammable crowns through which the fire will run, or when there is no longer any material on the ground to carry the surface fire. An ordinary crown fire will jump a wide fire line, and many fires have been known to cross wide rivers, almost without check. In the mountains, a crown fire running up a slope is almost impossible to check.

Back Firing.

On level ground it is possible to stop crown fires by back firing, when the conditions are such as to make back firing possible at all. Thus in the pine forests of the Atlantic Coast crown fires are frequently checked by back firing. The back fire burns off the surface material, and thus in itself acts as a check to the crown fire, and, if the area burned by the back fire is large enough, will stop it in this way. At other times, when the back fire has been successfully started and is well under way, eating back against the wind, it is caught by the hot volume of air generated by the heat of the crown fire. The flames are then turned quickly toward the crown fire, and the meeting of the two lines of flame stops the advance of the fire.

When fires gain such headway that it is impossible to stop them by direct attack, no matter how numerous and efficient the crew or complete the equipment for fighting, back firing becomes the only means of stopping the fire. It should, however, be used only when it is absolutely necessary. One of the commonest mistakes in fighting fires is to overestimate the rapidity of the fire and the difficulty of putting it out. A forest fire is always a frightening spectacle, particularly if it is sweeping in the direction of one's own property. Men often become excited and start back fires when it is entirely unnecessary. Back firing necessarily involves deliberately burning over property. When

this belongs to another person and one's own forest seems in danger, there is a great temptation to sacrifice it.

A second principle in back firing is to burn over as small an area as possible. The counter fires are therefore set only as far ahead of the fire as is necessary to make them effective. Very often, however, there is only one point from which a back fire can safely be started, so that the fighters have no choice.

If it is found that a back fire is necessary, a favorable point is selected directly in front of the fire, from which to set the new fire. This must be a point where it is safe to start a back fire, such as a road, fire line, stream, or swamp. The leaves are ignited at points five feet to a rod apart for a distance not greater than the estimated width of the head of the fire. These small fires gradually meet and form a continuous line, eating back against the wind. A part of the crew is stationed across the road or other break from which the back fire is started and put out at once the small fires which may result from the sparks blown over from the back fire.

The meeting of the two fires stops at once the head of the main fire. It is usually possible then to attack the wings with the ordinary methods of fighting. It is necessary to attack the wings at once, particularly if there is a strong wind, for otherwise each wing of the old fire would soon form an independent fire with a well-developed head. It is necessary, also, that a number of men be stationed where the original fire and the back fire meet in order to extinguish smoldering fires in tops, logs, and other débris.

Patrol After a Fire is Extinguished.

A fire is never out until the last spark is extinguished. Often a log or snag will smolder unnoticed after the flames have apparently been conquered, only to break out afresh with a rising wind. After the fire-fighting crew has left the ground it is always well to assign at least one man to patrol the edges of the burned area until it is certain that the fire is entirely out. This may not be for several days.



PREVENTION OF FOREST FIRES IN MINNESOTA

By GEN. C. C. ANDREWS,
FORESTRY COMMISSIONER OF MINNESOTA.

(An address delivered at the Lake States Conference, December 6.)

IN THE past forty years deplorable calamities have occurred in the Lake States from forest fires. The proclamation of Gov. Fairchild stated that the loss of life in the forest fire of October, 1871, in Wisconsin was at least 1,000 and that 3,000 persons were left homeless. Private contributions for relief which had been received at the executive office alone up to the end of 1871 exceeded \$166,000, and the loss of property by the fire was estimated at \$3,000,000. Ten years later the fire in southeastern Michigan, September, 1881, caused by settlers burning brush, ran over 48 townships, burned to death 138 people, rendered hundreds of families homeless and destroyed over \$2,000,000 of property. The money and supplies contributed for relief exceeded a million dollars. By the forest fire near Phillips, Wisconsin, July, 1894, thirteen people perished. In the Hinckley, Minnesota, forest fire, September 1, 1894, 418 people perished and the relief furnished to 2,045 sufferers amounted to \$184,744.

At the time of the Hinckley fire Minnesota had a law making it a misdemeanor to set on forest or prairie land fire that endangered the property of another, but there was no particular system for its enforcement. The Hinckley disaster led to making town supervisors fire wardens with a central directing officer called chief fire warden, but since 1905, forestry commissioner, with the trivial expenditure by the state of only \$11,000 a year. Under this system and with an area of 18,000,000 acres where the pine had its home, with increasing risks from the activities of new settlements, logging and mineral industries, campers, tourists and hunters, and notwithstanding many dry seasons, the average annual loss by forest fires, according to fire wardens' reports during the thirteen years from and including 1895 to 1908, when the Chisholm fire occurred, was only \$30,000. During that period not only much property but several villages, schools, and many lives were saved by the efforts of fire wardens.

In the Chisholm fire no lives were lost. That fire was started by careless fishermen, ten miles away from Chisholm, in an unorganized township, and it is my firm opinion that the village of Chisholm would not have been destroyed but for the presence of abundant slashings in the path of the fire. Liberal contributions were made by private citizens for the sufferers in the Chisholm fire, as was recently done for the sufferers by the Baudette fire of this year. I hoped the Chisholm experience would have induced our legislature to be much more liberal than it had been with money for the prevention and suppression of such fires, but the only increase it made was \$9,000 a year, making \$21,000 annually for all purposes for the forestry commissioner's department. The weather the present year from April to November, proved exceptionally dry and dangerous. Twenty-six rangers were put on duty in June, but their service had to be dispensed with September 1st for lack of money. The Baudette fire in which 29 people perished and perhaps \$1,000,000 or more of property was destroyed, occurred October 7th. It was a tornado that made the fire so fatal. Mr. George Chapin, who had served two seasons as ranger in

that locality, in an investigation since the fire, assisted by Mr. Frank Curtis, a cruiser living in the region, found that the origin of the Baudette fire was from a combination of four fires that had been burning in swamps, three of which had been started by settlers and one by sparks from the railroad locomotive. It is probable that if there had been means for continuing ranger service in that locality the calamity would not have occurred.

We must remember that the forests of Minnesota are worth \$100,000,000 and that they increase in value by growth at the net rate of 2 per cent per annum or \$2,000,000 a year. The \$21,000 appropriated annually for protecting these forests from fire is scarcely enough for effective work in any one out of eight large counties requiring fire warden service. Minnesota has been criticised by the press of the entire country for its parsimony. A costly tuition has taught us that we must have more stringent laws for the prevention of fires, and more money for their enforcement. The careless use of fire that has been habitual in the forest regions of our northwestern states would not be permitted in a country like Germany.

A large per cent of forest fires are set by sparks from railroad locomotives. There are in Minnesota in round numbers 2,000 miles of railroads, including logging roads in the forest regions. Locomotives equipped with the best spark arresters will, on an up-grade with heavy train, emit sparks; hence our law of 1909 required railroad companies to employ patrols in "a dry season." Instead of complying with this, the law was contested by railroad companies and three district judges of the fifteenth district held that the words "dry season" were too indefinite and the law invalid. The prosecutor in criminal cases cannot appeal and the state has been unable to have the law construed by the Supreme Court. Our remedy must be to copy the New York law of 1909 which requires railroad companies operating in forest regions to maintain an efficient fire patrol from April 1st to November 1st, and if they fail to do so, then the state shall do it and the railroad companies pay for it. At present railroad companies pay in the aggregate large amounts for damages caused by fires they set. Forest fires discourage new settlers from going upon the vacant lands. It is for the best interest of such companies to take more pains than they have hitherto done for the prevention of such fires along their lines.

In 1905 I presented to the legislature a bill that had been drawn with the assistance of the best legal talent in St. Paul, providing that if those who cut wood and timber for commercial purposes did not burn the slashings the state would do it and the expense be a lien on their property; but the opposition to it was too strong. I firmly believe that if it had been passed and enforced, neither the Chisholm nor Baudette calamity would have occurred.

I presented evidence to the forestry committees of the last legislature that under the regulations of the Interior Department of the United States, slashings from winter logging in the Minnesota National Forest were successfully burned at the time of cutting; but at the earnest request of representatives of logging companies, the bill which I had prepared was amended to read: "Said burning shall be done as soon as practicable at a time when it can be done without danger and before the first day of May next following." But this law has not proved successful and it is necessary to enact a law requiring branches to be lopped from the tree and burned at the time of cutting by piling them upon a fire, where the logging is between November 1st and April 1st. All laws should be administered with common sense, and with a spirit of justice and it is to be hoped, in view of the sad experience we have had, timber producers generally will support such a law and give it a fair trial. There must be some spirit of sacrifice all around if we are to succeed in averting the terrible forest fires that discredit our civilization.

Every good citizen wishes to promote the welfare of the new settler who in good faith tries to make a home in the forest wilderness. The state in some localities has not yet done its duty towards such settlers nor promoted its own best interest in the matter of main roads. There is an almost overpowering temptation for many settlers whose land is incumbered with brush to set it on fire in very dry weather. The yielding to such a temptation, however, has caused many bad forest fires. Many a poor settler has lost all his hay by the over-confidence or negligence of a neighbor in the use of fire in dry weather. But there must be a change; and I recommend a provision of law that from April 15th to November 15th no one shall set fire to brush, stumps or meadows in the forest regions without first making a fire-break of bare earth a rod wide between the place of fire and the property of another, nor without first obtaining the consent of the town board.

The 26 rangers employed from June 1st to September 1st proved in most instances useful. They were successful in securing quite a number of prosecutions and convictions for violation of the forest fire laws. It is seldom a local warden is willing to prosecute a fellow townsman. There are 700 townships in which ranger or patrol service could be useful in very dry weather. If one ranger had charge of only ten townships it would require 100 rangers. The expense of adequate patrol and ranger service will be about \$100,000 a year. If we could find a George Washington in every township who would be willing to serve as fire warden or patrol, the problem of forest fires would be solved. Your ideal man who has the energy, courage, and honesty to make a thoroughly efficient ranger or patrol is not so easily found. It requires very good pay to secure the services of such a man. Of course all appointments in the forestry service should be solely for fitness and without regard to party adherence.

As town supervisors are frequently changed I believe it would be an improvement of our present system to appoint permanently in each town, as fast as we can find a suitable man, one warden or patrol to take the place of the three supervisors and town clerk, who now are ex-officio fire wardens. If we could find such a man in each town, then would arise the question of wages. If he paid his own expenses it would be necessary to pay him three dollars a day. Watching against fires in dangerous weather and enforcing the slashings law in winter might require sixty or more days of his time. A really valuable man for such duty would prefer to stick to his farm.

The forest fire laws will not be respected unless enforced. The state cannot keep a watchman over every heedless person in the forest regions. Examples must be made of those who violate the law so that others will be restrained from negligence in the use of fire. While there have been praiseworthy exceptions, as a rule the county attorneys have proved of but little help in prosecutions under the forest fire laws. The incapacity of local magistrates is an obstacle in securing convictions. The advantage of penalties being under \$100 is in having speedy trials before local magistrates. If the penalty were above \$100 the case would have to go into the district court and be attended with considerable delay. The present appropriation for prosecutions is \$2,000 a year. But it is not enough for any one of ten counties that could be mentioned. There should be an appropriation of at least \$25,000 a year for prosecutions. We must pay respectable men for promptly looking up evidence and capable attorneys for conducting prosecutions.

If the legislation indicated prevails it will require considerable additional office force to attend to correspondence and supervision incident to the ranger, patrol and warden service, watching that a thousand different firms or individuals live up to the slashings law, that 2,000 miles of railroad are patrolled and prosecutions instituted and carried on with energy against violators of the law. The forestry commissioner's office must be strongly reinforced, and not with cheap men.

EDITORIAL

THE STATUS OF THE WEEKS BILL

THE Weeks bill as it passed the House at the last session is unfinished business in the Senate and by unanimous consent is to be voted on, with any amendments that may be offered, on the fifteenth of February. The title of this bill describes it as a bill "to enable any state to co-operate with any other state or states, or with the United States, for the protection of the watersheds of navigable streams, and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers."

The text of the bill is familiar to readers of AMERICAN FORESTRY. It passed the House on the 24th of June by a vote of 130 to 111. In the Senate its passage was prevented by a filibuster conducted by Senators Burton of Ohio, and Newlands of Nevada, the fact that Congress had determined upon adjournment, owing to the lateness of the season, the heat, and the pending political campaign, making the success of the filibuster possible, notwithstanding a large majority of the Senate would have voted for the passage of the bill.

The question of success or failure of this long-sought legislation, therefore, now lies in the upper house, and the fact that a rosy view of the prospect is held by many members of both houses, and that heretofore there has been a safe working majority in the Senate for bills designed to establish national forests in the Southern Appalachian and White Mountains, should not give us undue confidence, or lead us to relax our efforts in the least.

The situation is a critical one. We have been on the threshold of victory before, only to meet defeat in one way or another. The charge has been frequently made that neither house would pass the bill if some members did not have assurance that it would fail in the other house. We do not believe this. The fight in the last two Houses of Representatives has been a genuine battle and if the enemies of the bill in the House could have defeated it they would have done so. Nevertheless, the experience of weary years of hope deferred has taught us that nothing is certain at the Capitol until the votes are counted.

There has been but one test vote in the Senate for three years, the defeat of the bill having been twice due to hold-ups in the last days of the session. Last year on the question of making the bill unfinished business, the vote was 48 to 16. This vote roughly indicated the friends and opponents of the bill, although it was not a final division by any means.

The sixteen voting nay on that question are probably to be counted against the bill: Bailey of Texas, Bankhead of Alabama, Bourne of Oregon, Bristow of Kansas, Brown of Nebraska, Burton of Ohio, Crawford of South Dakota, Dick of Ohio, Gore of Oklahoma, Heyburn of Idaho, Hughes of Colorado, Jones of Washington, Newlands of Nevada, Paynter of Kentucky, Percy of Mississippi, Shively of Indiana.

It is probably correct to assume that on a straight vote the bill would pass the Senate, but it must be remembered that there are many shifts by which

opponents of a measure may block the game—even more under the open rules of the Senate than under the close rules of the House.

To friends of this measure we therefore say most emphatically: Take nothing for granted. Find out how your senators stand and if they are opposed to the bill, convert them if possible before the 15th of February. On that day we must have the votes to pass this bill, in such form that it will not be thrown into conference, or there will be little left to save in the White Mountains, at least, and a tremendous task of reforestation will have been created before another bill can have been put through the tortuous legislative channels.

There is danger in a conference because this is the short session. There is very little time between the 15th of February and the 4th of March, when this Congress expires by limitation, and all the tedious work of initiating and advancing the bill would have to be done over again. A conference offers an opportunity for the use of obstructive tactics again in the last days of the session. Senator Newlands announces his purpose to press his conservation commission amendment, and other amendments may be offered which would throw the bill into conference. They must not be passed. Let your senators know that the people of the eastern United States almost unanimously, and a large number of the best citizens of other sections want, not a mere perfunctory vote, but the immediate passage of a bill that can be put into effect.

This measure has been held up too long. It will return to trouble Congress until some satisfactory measure becomes a law. It has few opponents, but they are active. Its friends must continue their activity up to the moment when the bill goes to the President. Then, and then only, it will be safe.

THE LAKE STATES CONFERENCE

HERE is great promise in such gatherings as the Lake States Forest Fire Conference held last month in Saint Paul. It is probable that the era of great national congresses to deal with conservation subjects of which the American Forest Congress of 1905 under the auspices of the American Forestry Association was one of the first and the most fruitful, has reached its zenith. They have done their work of arousing the people, of bringing certain great questions into the full light of discussion and making them matters of popular interest. Outside of a few to whom such gatherings are a recreation, and of political leaders to whom they furnish an opportunity, people will not give much time to these crowded gatherings and over-crowded programs, but they will go a long way to discuss with men who know how to do them the things that they are now quite certain must be done.

Out of the assembling of such varied interests as met at Saint Paul, varied in their point of view but with that view focussed on the same object, will come real forest conservation and by and by real forest development. Why? Because every interest of our people, selfish and unselfish, looks to the same end, and as this is real life and not a debating society, the workers must get together and agree on a policy. Such a course is infinitely better economics and better politics than spending good energy in debating non-essentials.

Throughout the country the same spirit is making itself manifest in divers ways and the men in the far West who are fighting an alleged theory of nationalism that no one has really advanced, and the extreme nationalists who are tilting at a state rights doctrine that is not seriously held by any man of statesman's size in the United States, can profitably follow the general example and get together to work for the common good.

A STATE'S UPBUILDING

A LEADING article this month calls attention to the noteworthy development of forestry in New Hampshire, to which reference was made in our September issue, in connection with the meeting of the Society for the Protection of New Hampshire Forests. So marked has been this progress that it might almost be described as regeneration. More than forty years ago when everyone regarded our forests as inexhaustible and hardly anyone had begun to appreciate their protective and sanative values, the Granite State parted with the last of its mountain lands. At that time this was quite natural. Today it would be regarded as a crime. So far have we advanced in knowledge and lost in forest wealth.

Like most of the older and especially of the agricultural states, New Hampshire was slow to realize the consequence of its error and slower still to adopt a new policy. It happened also that there grew up within the state a type of politics which did not always serve the people well and which affected forestry and agriculture as well as all other interests of the state. Everything was dominated by the railroads and strange results followed.

The last few years have seen a change, striking and encouraging—the revolt against the railroad empire, as Mr. Churchill has named it, the struggle of good citizenship to assert itself, and a consequent revolution in many of the little strongholds of the old system. A very active part in this development has been played by the Society for the Protection of New Hampshire Forests. It is and has been wholly outside of politics, but its vigorous work has been on the side of good citizenship and of more intelligent and unselfish administration of the state's affairs. Through the men whose personal influence receives due credit in Mr. Brown's narrative, the forestry commission became vitalized into a big, aggressive force. Its leading member won his spurs in the commission and in the legislature and has been duly promoted to the governorship, and today the forestry movement is nowhere more active than in this old conservative commonwealth. It is suggestive to note through all this the intimate relationship between forestry and good citizenship.

It is a splendid record that the people of New Hampshire are making and they can no longer be charged with backwardness in this direction. With the national forests that must come in the White Mountains as a nucleus, we now look hopefully forward to seeing the state build around this a system of state forests and forests and mountain parks which will be objects of interested study by foresters and civic improvement advocates everywhere.

A SUGGESTION FOR FULLER STATISTICS

SOME months ago there was started on its round of misrepresentation one of those statements of fact which is so much more injurious than a falsehood. It was in the form of a table showing the total acreage of the states of California, Colorado, Idaho, Montana, Oregon and Washington, the "reserved acreage" (by which is meant the national forests) in each, and the percentage of the latter to the former, showing an average reservation in the six states of 26.9 per cent. This was used by the diligent newspaper opponents of the national forest system as a text for their attacks on that system, and it crops out from time to time in other journals farther east, being used to show that "conservation" is detrimental to the prosperity and civilization of the national forest states.

For example, a leading paper in Michigan took it up and pointed out that a proportionate reserved area in Michigan would amount to ten million acres

and could not be "taken out" of Michigan without destroying thousands of acres.

Nothing could be more absurd. Has Michigan any mountains like the Rockies, Sierras, Cascades, Olympics, or other Pacific ranges in which most of the national forests in the six states are located. If it had how many Michigan farms and homes would be found among them?

Again, the national forests are not "taken out" of a state. The land is simply devoted to its best uses—timber production and watershed protection. It is "reserved" only from private exploitation which would destroy it for the purposes indicated for it by the natural topography. This is true of the larger part of the acreage referred to.

We suggest that the anti-national forest statisticians devote a part of their efforts to a tabulation of the exact amount of land available for agriculture and settlement included in the reserves and then study the land laws and the practice of the Forest Service to determine how much of this is actually cut off from settlement. The imposing figures they now use would be materially diminished by such a study, and the study would serve a useful purpose in that it would correct misconceptions, instead of creating them.

CURRENT LITERATURE

REVIEWS

The Conservation of Natural Resources in the United States. By Charles Richard Van Hise. New York, Macmillan Company, 1910. Pages 413. Price, \$2.00

Dr. Van Hise's orderly statement and summary of the main facts and principles of conservation is exactly what is needed. The report of the Conservation Commission, from which he has drawn largely for facts, is not likely to be much used by the general reader or student. This volume, of about four hundred pages, makes a convenient manual for the special student or the average citizen. It contains the substance of twenty lectures given at the University of Wisconsin. Its purpose is to furnish a correlated statement of the essential information which an intelligent citizen might desire with reference to conservation. The author is probably as well fitted as any man in the country for this task by scientific knowledge, experience, and close study of the conservation movement in which he has taken an active part. He disclaims any attempt at originality and recognizes the impossibility of satisfying in a survey of this kind specialists in any of the branches treated. He must be given full benefit of these qualifying statements in any estimate of the book, for he has assumed a difficult, necessary, but rather thankless task and has done it well.

There is a brief introductory history of the conservation movement and here we

find it necessary to enter a slight criticism of incomplete and inadequate treatment. Dr. Van Hise recognizes the initial influence of the forestry movement in the development of the conservation idea, but he entirely overlooks the great work done in that field by the American Forestry Association since its organization in 1882. He gives the credit for bringing about the organization of a government bureau of forestry entirely to the American Association for the Advancement of Science and the National Academy of Sciences. The splendid work done by these bodies deserves all the praise that can be accorded them, but it is not entirely just to overlook the constant and effective work done through three decades by the first real conservation organization in the country, which has built up a national membership of several thousand, and is still doing an important work. The first really great national conservation congress was the American Forest Congress of 1905, held under the auspices of the American Forestry Association, when the Hon. James Wilson was its president and Gifford Pinchot the chairman of its executive committee.

Following the introduction, Part 1 deals with the mineral resources of the country, taking up successively coal, peat, petroleum and natural gas. The metallic resources—iron, copper, lead, zinc, gold, silver and the subordinate metals—are then treated. Part 2 deals with the important subject of water, its sources, amount, run-off, navigation and irrigation. Part 3 is devoted to forests and

discusses the original and existing forests, the consumption of the forest, and the various branches of this consumption. Part 4 treats of the land, taking up the soil, land classification, land ownership and farm lands. Part 5 discusses conservation and mankind, the principles of conservation, the purpose of conservation, the conservation of man himself, population and conservation and conservation and patriotism. The appendices contain the declaration of governors for the conservation of natural resources, the declaration of principles of the North American Conservation Conference, and the statement of principles of the National Conservation Association. From this brief outline of the principal heads, it may be seen how comprehensive is the book in its treatment. We shall not attempt any critical examination of the several sections. It is sufficient to say that they are probably the most authoritative brief statements of the subjects they cover that is now available in book form. There are sixteen plates, most of which are pictures of forestry subjects or of land conditions closely related to forest protection, and there are twenty maps and charts.

Finally, we should say that this book is one that should be in the library of every intelligent citizen who wishes to keep abreast of current topics.

The Boy With the United States Foresters.
By Francis Rolt-Wheeler. With thirty-eight illustrations from photographs taken by the U. S. Forest Service. Boston, Lothrop, Lee & Shepard Company, 1910. Pages 317. Price, \$1.50

This book, the second in the United States Service series, is a boys' book on somewhat new lines and one of those that can be read by boys of any age from ten to seventy plus. Its obvious intent, to teach some of the elementary facts of forestry and especially of the conditions in the national forests, their relation to the people and their administration, is well carried out without making the book pedagogical, or interfering with the trend of the story. The latter is simple enough. It is an account of the experiences of a young fellow of the right kind who, as a preliminary to a higher technical education in forestry, entered the service of the United States as a forest guard. His experiences and adventures, which are typical of the life of national forest officers, form a chain of adventures that will hold the reader's attention to the end, and it will be strange if it does not make him love the Service and appreciate its task and its difficulties, as the author evidently intended his readers should. The note of purpose in the book, combined with an interesting narrative of real life adventures, makes it safe and wholesome reading for any normal boy.

Many things that need to be well understood are very well and plainly stated, as when the old ranger, a woodsman of long experience, says: "Once we had to fight tooth an' nail agin the forest jest to get enough land to live on, an' now we've got to fight jest as hard for the forest so as there'll be enough of it for what we need;" and again, when the supervisor, in reply to Wilbur's suggestion that the telephone seems to destroy some of the primitiveness of the forest, says: "You don't want to run into the mistake of thinking that life on a national forest is principally a picturesque performance. It's a business that the government is running for the benefit of the country at large. Anything that can be done to make it efficient is tremendously important. The telephone already has saved many a fearful night ride through bad places of the forest, has been the means of stopping many a fire, and has saved many a life in consequence. I think that's a little more important than 'primitiveness,' as you call it." We commend this straightforward statement to some of our congressmen who have under consideration appropriations for the improvement of the national forests.

MONTHLY LIST FOR DECEMBER, 1910

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NATIONAL FOREST WORK

The Harvest of Hickory

The Office of Wood Utilization of the Forest Service, United States Department of Agriculture, is co-operating with the National Hickory Association in a comprehensive investigation of the country's hickory problem. The annual cut of more than 300 million feet, exclusive of fuel, is well known, but it is not so well known what becomes of it, or whether it is all put to the best uses for which it is fitted. It is well understood that the country's hickory supply is limited. It probably does not exceed ten billion feet. This is really the world's supply, because the wood grows only in this country. Thirty-four states contribute, but two-thirds of the supply comes from half a dozen. It is one of the most important woods of this or any other country, and for a number of purposes no satisfactory substitute has been found for it. The need, therefore, of securing all possible information is apparent.

It is a wood so valuable for special uses that it ought not to take the place of common lumber, while it is not believed that a very large quantity is so used, yet there are no statistics showing where all the 200 million feet cut by ordinary sawmills goes. It ought to go to handle mills, carriage shops, and factories that demand it for special and exacting purposes, but it is not known that it all goes there. In fact, it is known that some—probably not much—makes crossties, fence posts, bridge plank, and other firm timbers. Such use of this valuable wood should not be encouraged. Dozens of cheap and plentiful woods give better service in such places, and it is the worst kind of economy to let good hickory be so diverted while it is in constant demand for carriages and handles.

The investigation will look into the use of hickory as fuel. It is one of the very best woods for that, but logs fit for buggy rims, ax handles, or sucker rods, should not go to the wood pile. The hickory lumberman should have first choice, and the firewood cutter ought to be satisfied with what is left. It is interesting to note that meat packers in many of the cities, and smaller towns as well, prefer hickory to all other woods for smoking meat, and large quantities are so used. This matter will be included in the investigation, and the demands of packers for smokewood will be considered. Doubtless they can use rough and knotty wood as well as the fine grades, and would not insist on clear, straight grained hickory for their smokehouses, if inferior grades were available. Hickory knots ought to make as good smoke as hickory ax handle stock.

It has been asserted that the waste of hickory in the woods and at the mill is unnecessarily large, but the assertion has been strongly denied. Perhaps similar conditions do not exist in different regions. A thorough investigation of this phase of the question is under way, and it will be carried out by field work in four typical hickory states, Missouri, Mississippi, Louisiana and North Carolina, and by correspondence in twelve other states.

When all obtainable facts relating to cutting, manufacturing, and marketing hickory have been collected, together with the uses to which it is put, the information will be made available to the thousands of owners, manufacturers, and users of this valuable wood in all parts of the country, and it is believed that the information will assist them in turning every stick to the best possible account.

An Active Planting Campaign

Associate Forester Potter is quoted as authority for the statement that as many new trees will be planted under the direction of the Forest Service in the national forests during the fiscal year as were set out during the past five years combined. This is the beginning of a plan to increase as much as possible each year the number set out. The seeds which provide nursery stock are planted in the fall of the year, while the nursery stock is set out both in the fall and in the spring. The elimination of certain areas from national forests because they have been found to be more valuable for agriculture than for forestry, and the addition to the reserves of certain parts of the public domain considered more adaptable for forestry purposes, have been practically completed, and now that the permanent boundaries of the reserves are better known there will be increased activity in setting out new stock.

The Work in Florida

Raphael Zon, chief of sylvics, and Theodore S. Woolsey, assistant district forester, have been in Florida, studying the situation there with reference to the Choctawhatchee and Ocala national forests, and the possibility of growing eucalyptus in Florida. Their presence seems to have aroused much interest. The *Tampa Times*, of December 6, reports their arrival in that city to examine the five-acre tract of land which was donated by the Mutual Realty and Investment Company to the government for the purpose of conducting experiments with eucalyptus trees. This matter was in charge of the local board of trade.

It is estimated, says the *Times*, that several thousand trees will be planted on the tract. Messrs. Zon and Eldridge came here from Pensacola, where they have been conducting a similar investigation.

Florida papers say that Mr. Zon already entertains a high opinion of the Florida territories, and is of the opinion that both the Choctawhatchee and the Ocala forests offer excellent opportunities for forest planting, its success depending largely on the proper choice of species and the general preparedness when the time comes for planting. Florida seems well supplied in its own kind of species, and it is intended to take advantage of these in all cases of reforestation and in the planting of new and virgin areas. In the Ocala forest it is thought that maritime pine, cork oak and loblolly pine will do well, while in the southernmost part of that forest the eucalyptus will adapt itself very readily to the conditions.

When it comes to the planting of seed for trees, there are a number of obstacles to overcome and hindrances to offset in order to assure anything like successful results. Should the territory be the habitat of the rodent family, the chipmunk, ground squirrel, gopher and the like, all seed beds are liable to serious damage and

depletions. While every precaution is usually taken to protect the beds as far as possible, some one or more of the enumerated pests are sure to make serious inroads, and in a short time will destroy the better part of the plant.

Boundary Changes

The following recent additions to, and eliminations from, the national forests have been announced. In all cases unappropriated lands that have been eliminated are restored to entry and settlement:

Forest	State	Add. acres	Elim. acres
Apache	Arizona		70,376
Crook	Arizona	149,800	4,480
Prescott	Arizona	132,825	81,081
Sitgreaves	Arizona	23,966	68,415
Tonto	Arizona		7,040
Arkansas	Arkansas		400,911
Stanislaus	California	6,870	3,084
California	California	4,784	58,732
Arapahoe	Colorado		2,561
Routt	Colorado		101,802
Toiyabe	Nevada	311,793	65,755
Wichita	Oklahoma	1,204	360
Ashley	Utah	2,540	
Powell	Utah	27,409	55,680
Uintah	Utah	37,205	
Chelan	Washington		17,610
		698,496	937,687

STATE WORK

The Massachusetts Forestry Association

The annual meeting of the Massachusetts Forestry Association was held in Boston on the 15th of December. Nathaniel T. Kidder of Milton, was reelected president; Irving T. Guild of Arlington, secretary; and Ernest B. Dane of Brookline, treasurer. Frederick B. Knapp of Duxbury, and Edward S. Bryant of Boston, were elected members of the executive committee for three years. The vice-presidents, one from each county of the state, were reelected. The treasurer's statement showed receipts of \$2,820.64, and expenditures of \$3,059.78, with a balance on hand of \$724.61. The permanent fund amounts to \$11,217.87, and yielded last year an income of \$552.14.

Owing to local conditions and needs, the association specialized somewhat in its work for the year upon the city shade tree problem. Efforts by it and other organizations resulted in the preparation of a shade tree ordinance for the city of Boston, which is considered as complete as that of any city in the country. Newark, Providence, Cleveland and Chicago are now in the lead with shade tree legislation, but Boston, if it passes the new ordinance, will have profited by their experience. The association also shared in promoting several local tree planting enterprises and secured the pas-

sage through the legislature of a law providing that in case the boundary of a highway is for any reason uncertain and consequently the right of a city or town to enforce jurisdiction over any given roadside tree is disputed by an abutting property owner on the ground that it is not within the highway limits, it is necessary for the property owner to prove in court his ownership of the tree, otherwise it shall be taken to be in the highway. The amendment also amplified the definition of a public shade tree as not only one which stands within the limits of the highway, as the law has previously defined it, but also includes trees which stand upon the boundary line.

Another law which was successfully advocated by the association extends to city officers having the care of shade trees all the powers and duties now conferred upon the tree wardens of towns.

The proposal to amend the state constitution to permit classification of property for taxation was again before the legislature during the past session, and the association advocated this change on account of its effect upon forest taxation. No result has yet been reached.

Among state laws which were passed at the instance of the state forester, were: (1) An act prohibiting the liberating or

flying of fire balloons anywhere within the state, carrying a penalty of a fine not exceeding one hundred dollars, or of imprisonment not exceeding one month, or both; (2) A provision by which the state forester may reimburse towns for fifty per cent of their expenditures in preventing and extinguishing forest fire or for making protective belts or zones as a preventive against forest fires, no such reimbursements to exceed \$250; (3) A provision by which the state forester, with the approval of the governor and council, is authorized to accept bequests or gifts to be used for the purpose of advancing the forestry interests of the commonwealth.

New Hampshire Timberland Owners Meet

A meeting of the large timberland owners of the state was held at Gorham, New Hampshire, December 15th, for the purpose of perfecting their association for fire protection and general co-operation. The firms represented were International Paper Company, Berlin Mills Company, Conway Company, Publishers Paper Company, Connecticut valley Lumber Company, Coe & Pingree Estate, Odell Manufacturing Company, Livermore Mills Company, Champlain Realty Company, Geo. M. Blanchard & Son Co., E. Libby & Sons Co., C. M. C. Twitchell Estate, Sinclair-Stahl Company, A. M. Stahl, Pike Manufacturing Company, H. B. Hinman Estate, Dartmouth College Grant, Johnson Lumber Company, Bretton Woods Hotel Company, Balsams Hotel Company, Profile Hotel Company.

Addresses on the work already accomplished by the association in the way of establishing a large number of mountain fire lookout stations throughout the state, and the proposed protection work for the coming year were given by W. R. Brown, of the New Hampshire Forestry Commission, and E. C. Hirst, State Forester.

The officers elected were W. R. Brown, of the Berlin Mills Company, president; W. H. Bundy, of the Conway Company, vice-president; George S. Lewis, of the Connecticut Valley Lumber Company, Frank P. Thomas, of the International Paper Company, and Charles C. Wilson, of the Odell Manufacturing Company, to form a directorship together with the president and vice-president, of five members. Three committees were appointed—fire protective, legislative and auditing. It was voted to hire a forester and work in co-operation with the state.

Over a million acres were represented at this meeting, and a maximum assessment of one cent per acre per year was voted to carry on the work. Membership is desired of all timberland owners in the state. The office of the association will be at Gorham, N. H.

Pennsylvania Forestry Association

At the annual meeting of the Pennsylvania Forestry Association in Philadelphia, on the 12th of December, Dr. Joseph T. Rothrock, its secretary, recommended the opening of the state forest reserves to limited cattle grazing, hunting and fishing, and to parties of campers and heath seekers.

In his annual report to the association, President John Birkinbine urged that politics be kept out of the forestry movement and deplored the division of conservation advocates on the question of national or state control, declaring that the forestry movement needs no political slogan to make it important.

The law committee of the association is now at work on a bill to revise the system of taxing forests, which it is hoped to bring before the next session of the Pennsylvania legislature.

The following officers and a council at large, representing the counties of the state, were elected: President, John Birkinbine; vice-presidents, William S. Harvey, James C. Haydon, Alfred Lewis; general secretary, Dr. Joseph T. Rothrock; recording secretary, F. L. Bitler; treasurer, Charles E. Pancoast.

West Virginia

While fires are the most destructive enemy to the large forests of West Virginia, the loss sustained in this state from rot and depreciation of debris runs into millions of dollars. But few of the lumbermen of this state are getting from the forests what should be gotten, fully 30 per cent of the tree being left in the forest to rot and decay. Men interested in the lumber business of West Virginia will seek at the coming session of the legislature to secure better protective forest laws, according to the *Wheeling Intelligencer*, which estimates the loss from rot and depreciation of debris as second only to that from fire.

During the year which is now rapidly drawing to a close the destruction of forests in West Virginia by fires, will be the smallest in recent years. This fact is largely attributed to the establishment of a forest, game and fish department. It is estimated that fully \$2,000,000 was saved during the year just closing at a cost of a little over \$1,500. The present administration has accomplished many things that have proven of great benefit to the forests, but the work has only just started. The requirement of spark-arresters on all railroad trains used in the woods, was an important step in the matter of saving the forests. The prohibiting of the building of fires through the woods and other laws have helped the tree.

With but few exceptions the lumbermen pay no attention to their pulp wood and leave it to rot in the woods, while others pay no attention to their slabs. It is estimated by lumbermen that the waste in slab wood alone in West Virginia, for the past five years, will exceed a million dollars a year. Efforts have now been made to prevent this loss and a number of the lumbermen

are placing their slab wood on the market with good results. West Virginia is one of the largest lumber producing states in the east and her revenue from timber reaches many millions each year. Unless the legislature continues the fight against the destruction of the forests it will only be a matter of a few years until this state will have but a limited supply of timber.

NEWS AND NOTES

Canadian Forestry Convention

Sir Wilfred Laurier, the premier of Canada, has issued an official summons for a Dominion forestry convention, to be held in Quebec January 18-20, 1911, and notices have been issued by James Lawler, secretary of the Canadian Forestry Association, which will have charge of the arrangements. The governor general will open the convention and the president of the association, Hon. W. C. Edwards, will occupy the chair. Among those who, it is hoped, will take part in the convention, in addition to official representatives, are Sir Wilfrid Laurier, Mr. R. L. Borden, M. P., Hon. Clifford Sifton, chairman of the Commission of Conservation; Hon. Sydney Fisher, Hon. Frank Oliver, Sir Lomer Gouin, Hon. Jules Allard, Hon. Frank Cochrane, Hon. W. C. H. Grimmer, His Grace Mgr. Begin, Archbishop of Quebec; R. H. Campbell, Dominion Superintendent of Forestry; H. S. Graves, Chief Forester of the United States; Dr. H. S. Beland, M. P.; Dr. B. E. Fernow, Dean of the Faculty of Forestry of the University of Toronto; Achille Bergevin, of the Quebec Fish and Game Protective Association; and Dr. C. Gordon Hewitt, Dominion Entomologist. The Legislature of Quebec will be in session, and the Commission of Conservation will hold its annual meeting in Quebec on Jan. 17.

This convention will have much the same breadth and scope as the American Forest Congress of 1905, and an invitation to participate has been extended to representatives of the United States Forest Service, the American Forestry Association, the National Conservation Association, and state forestry bureaus and associations.

The Use of Poles in 1909

The total number of poles reported to the Bureau of Census as purchased during the calendar year 1909 by the telegraph and telephone companies, steam and electric light and power companies of the United States was 3,739,000, as against 3,249,000 in 1908 and 3,283,000 in 1907. There were purchased in 1909 by the same class of users 3,509,000 cross-arms, 6,168,000

brackets, and 18,463,000 insulator pins. Cross-arms, brackets, and insulator pins were not included in the annual census of lumber and timber products prior to 1909.

Telephone and telegraph companies reported purchases during 1909 of 2,916,000 poles, or 78 per cent of the total, an increase over 1908 of 354,000 poles, or 14 per cent, and over 1907 of 604,000 poles, or 26 per cent. Steam railroads reported the purchase of 26 per cent more poles in 1909 than in 1908, though 34 per cent less than in 1907, while the reported purchases by electric railroads and electric light and power companies were 18 per cent greater than in 1908 and 7 per cent less than in 1907.

The average cost per pole of all lengths and from all species of wood in 1909, was \$1.89, as against \$1.82 in 1908, and \$2.46 in 1907, mainly for the reason that a class of pole consumers in the United States which uses chiefly short poles was not included in the census for 1907.

Cedar continues to be the principal pole timber, contributing 65 per cent of the total. Chestnut stands second, oak third, and pine fourth, these being the only species of which more than one hundred thousand were used.

Substantial progress in the practice of treating poles with chemicals to preserve them from decay is disclosed by the returns for 1909, nearly one-sixth of the total purchases during that year having been given some preservative treatment, as against about one-tenth in 1908 and one-eighth in 1907.

The Appalachian Forest Bill

The status and importance of the Appalachian forest reservation project is compactly presented in an editorial in Collier's Weekly, reproduced on this page.

The measure, which has passed the the house, comes up before the senate for final disposition on February 15, 1911.

It is needless to emphasize to readers of *The Constitution* the meaning and urgency of the bill.

It merely aims to attempt some systematic preservation of the mountain forest

lands which have a controlling influence on the navigability of streams in the Appalachian district, and, what is of even greater importance, on the continued fertility and freedom from erosion of southern farm lands.

This is, of course, not to mention the tremendous stake of preservation of water power which, in its way, holds one of the keys to the future development of the southern states.

It will be an excellent idea for southerners to communicate their wishes to southern senators, and to keep a keen eye on the proceedings of the upper chamber on February 15, 1911.—*Atlanta Constitution*.

At least, it is to be hoped that the senate will pass the Appalachian forest bill, authorizing the government and the states to take action toward conservation of water and protection against floods. It is a special order in the senate for Feb. 15, having already passed the house, and it should be adopted.—*Duluth Herald*.

Industries to Utilize Forest Waste

The Washington Conservation Association is planning an active campaign to bring into the state industries to utilize forest waste. This will be worked out along the lines of a plan prepared by the secretary of the association, R. W. Douglas. The immediate aim is to attract outside capital and men of experience to locate in the state to develop the secondary wood and wood by-products industries.

The plan, says the *Seattle Post-Intelligencer*, contemplates the creation of a central organization under the direction of an intelligent head of unusual business ability. It is proposed that this man devote his efforts to presenting the opportunities in secondary wood uses in Washington throughout the East, and that the principal industrial centers of the state through their commercial organizations direct their energies toward securing plants for their communities.

Mr. Douglas has prepared a list of nearly 500 articles which can be made in this state from the lumber now wasted. There are, he says, hundreds of others.

"Of all the trees cut down," says Mr. Douglas, "only a little more than one-third of their material reaches the market. A large proportion of the inferior wood sacrificed could be utilized in a practical and profitable manner.

"Men of capital can be induced to establish in this state industrial plants similar to those operated in other states, notably Massachusetts, Michigan and Wisconsin, for the secondary uses of wood and the extraction of by-products from our inferior wood and waste.

Mr. Douglas states that some of the waste lumber that can be utilized consists of windfalls, fire-scarred trees, decaying trees, stumps, bark, limbs, branches, tops, slabs, spalts, back ends, edgings, unused short lengths, unmarketable low grades of lumber, sawdust, shavings, chips and drift logs and boards, found on all beaches.

The Forests of Labrador

Official reports to the Newfoundland government of reconnaissances in Labrador show that the country is heavily wooded, and that in Hamilton Inlet, Sandwich Bay, and other districts on the east coast there is good timber and great water powers, while the region, being open to navigation for seven months of the year, possesses the same advantages for the pulp and paper industry as the mills in those parts of northern Europe which supply European centers today.

In Grosvenor Bay, or Hamilton Inlet, is one property of 4,500 square miles, or half as large again as the tract possessed by the Harnsworths at Grand Falls, Newfoundland. Adjoining it is a second area of 1,200 square miles and a third of 600 square miles. All are well wooded and conveniently situated on the shores of this vast inland sea. Some distance south, adjoining these areas and having an outlet at Sandwich Bay, are areas equally well wooded of 1,200 square miles.

Missouri's Forest Resources

Last year, says the *Drovers Telegram*, Missouri placed nearly \$25,000,000 worth of lumber and other forest products on the market, but it is not maintaining its capabilities in that line. A supervisor of the Arkansas National Forest recently called attention to this. According to this authority the timbered area of the state dropped from 60 per cent of the entire area of the state in 1900 to 39 per cent in 1908. Less than five billion board feet now remain and at the present rate of consumption this will last but a few years more. The standing pine timber of Missouri is already practically used up. There are millions of acres of soils in Missouri that are worthless for agricultural purposes, but capable of growing valuable forest trees. These should be utilized for the growing of forest trees, and not allowed to grow worthless bushes and scrub trees. Were those recommendations followed Missouri would, in time, be growing more lumber and utilizing its soil economically. She is not the only state that needs to produce more timber. The entire country needs more.—*Hannibal (Mo.) Post*.

AMERICAN FORESTRY ASSOCIATION

THIRTIETH ANNUAL MEETING

WASHINGTON, D. C. *January 12 and 13, 1911.*

The thirtieth annual meeting of The American Forestry Association will be held on Thursday and Friday, January 12th and 13th, 1911, at the New Willard Hotel, Washington, D. C.

The usual annual business will be transacted: Reports of the Treasurer and Secretary, election of officers, and any other business that may properly come before the meeting.

Thursday morning there will be a meeting of the Board of Directors and registration of members.

For information and registration prior to two o'clock Thursday, members will call at the office of the Association in the Maryland Building, 1410 H Street, Northwest.

Thursday afternoon there will be a business session at the Willard, and brief addresses.

Friday morning the subject of discussion will be the proposed Appalachian national forest legislation. Speakers to be announced.

Friday afternoon will be kept open for conferences and committees, including a meeting of the Advisory Board.

Friday evening the annual dinner will be held at the Willard. A special notice of this has been sent to the members and their attendance is cordially desired.

IMPORTANT NOTICE TO MEMBERS

Members of The American Forestry Association have been informed through this magazine of the new arrangement by which membership in the Association does not include the magazine as heretofore. The dues for annual membership were accordingly made one dollar instead of two dollars at the last annual meeting, the subscription to the magazine being two dollars. This arrangement was made necessary by a ruling of the Post Office Department in regard to rights of entry for AMERICAN FORESTRY as second-class mail matter. The new arrangement has been in operation during the year 1910 as regards new members, but did not affect those who had already received their bills for 1910 under the old plan. There are these options under the new plan: Membership with or without subscription to AMERICAN FORESTRY, or subscription to AMERICAN FORESTRY with or without membership in the Association.

We earnestly hope all of our members will retain both membership and subscription. The former will maintain their connection with a great movement which is constantly gaining in importance. The latter will give them their money's worth. AMERICAN FORESTRY has entered upon the most useful period of its career. Its work is well defined, its position is generally recognized, and it commands the best work of the authorities on forestry. It occupies its field alone and it is one of the magazines of authority that the man or woman who wishes to be well informed on public questions cannot afford not to read.

YALE FOREST SCHOOL

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The course of study in the YALE FOREST SCHOOL covers a period of two years. Graduates of collegiate institutions of high standing are admitted as candidates for the degree of Master of Forestry.

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